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# **RouteFinder<sup>®</sup>**

**Internet Security Appliance**

**RF850**  
**RF860**

**User Guide**



**User Guide****RouteFinder RF850/860****Document Number: S000400E, Revision E**

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**Record of Revisions**

<b>Revision</b>	<b>Date</b>	<b>Description</b>
<b>B</b>	06/01/06	Added explanation of Load Balancing on the Network Setup screen.
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<b>D</b>	09/05/07	Added "Description of Syslog Messages" to Appendix A – Disposition of Events. Updated the warranty statement. Added an RJ-45 Ethernet cable to the Ship Kit list. Added an FAQ about the Ethernet ports supporting 10/100 Mbps half-duplex and full duplex lines.
<b>E</b>	04/14/08	Changes for software version 3.34. Added a drawing of the RouteFinder with mounting brackets.
	05/04/09	Added a link to the Multi-Tech Web site for the Warranty statement.

**Warranty**

For Warranty information, see the Multi-Tech Web site at <http://www.multitech.com>

**Patents**

This device is covered by one or more of the following U.S. Patent Numbers: 6,219,708; 5,301,274; 5,309,562; 5,355,365; 5,355,653; 5,452,289; 5,453,986.

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# Chapter 1 – Product Description and Specifications

## Product Description

The RouteFinder® all-in-one security appliance is designed to maximize network security without compromising network performance. It offers a Stateful Packet Inspection firewall for the ultimate in firewall security. The RouteFinder security appliance uses data encryption, user authentication, and the Internet to securely connect telecommuters, remote offices, customers, or suppliers to the corporate office while avoiding the cost of private leased lines or dial-up charges.

## RouteFinder Documentation

The Quick Start Guide is intended to provide the experienced system administrator the information needed to quickly get the RouteFinder up and running.

The User Guide with more detailed information is provided on the RouteFinder CD or the Multi-Tech Systems, Inc. Web site.

## RouteFinder Features

See the RouteFinder Data Sheet for detailed descriptions of the following features:

- Supports IPSec and PPTP VPN tunneling
- Utilizes Triple Data Encryption Standard (3DES) and AES encryption
- Stateful Packet Inspection firewall with packet filter rules, DNAT, SNAT, and IP Masquerade
- Optional anti-virus subscription
- Free spam filtering for unsolicited bulk emails
- QoS (Quality of Service) / Bandwidth allocation
- Dual WAN load balancing and failover
- High availability
- Automatic dial-backup with built-in modem (RF860) or via an external dial-up modem or ISDN terminal adapter (RF850)
- Automatic system updates to protect your network against the latest threats and DoS attacks
- Application layer security using SMTP, HTTP, DNS, and SOCKS proxies
- Secure local or remote management using HTTP, HTTPS, or SSH
- Reporting function provides valuable troubleshooting information
- Three built-in Ethernet ports (LAN, WAN, WAN2/DMZ)
- Shared Internet access via PPPoE, DHCP or static IP
- Internet access control tools provide client and site filtering
- Traffic monitoring and reporting
- IP address mapping/port forwarding and DMZ port
- RoHS compliant
- Two-year warranty

## Safety Warnings

### Lithium Battery Caution

Danger of explosion if battery is incorrectly replaced. A lithium battery on the RouteFinder PC board provides backup power for the time-keeping capability. The battery has an estimated life expectancy of ten years. When it starts to weaken, the date and time may be incorrect. If the battery fails, send the board back to Multi-Tech for battery replacement.

### Ethernet Ports Caution

The Ethernet ports are not designed to be connected to a Public Telecommunication Network.

### Software Recovery CD Warning

Do not use the Software Recovery CD for any purpose except for re-installing software onto the RouteFinder hard drive.

### Telecom Warnings for Modem Operation

- Never install telephone wiring during a lightning storm.
- This product must be disconnected from the telephone network interface when servicing.
- This product is to be used with UL and cUL listed computers.
- Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone during an electrical storm. There may be a remote risk of electrical shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.
- To reduce the risk of fire, use only No. 26 AWG or larger telecommunications line cord.
- Never install telephone jacks in a wet location unless the jack is specifically designed for wet locations.

## Safety Recommendations for Rack Installations

- Ensure proper installation of the RouteFinder in a closed or multi-unit enclosure by following the recommended installation as defined by the enclosure manufacturer.
- **IMPORTANT:** Do not place the RouteFinder directly on top of other equipment or place other equipment directly on top of the RouteFinder.
- If installing the RouteFinder in a closed or multi-unit enclosure, ensure adequate airflow within the rack so that the maximum recommended ambient temperature is not exceeded.
- Ensure that the RouteFinder is properly connected to earth ground via a grounded power cord. If a power strip is used, ensure that the power strip provides adequate grounding of the attached apparatus.
- Ensure that the main supply circuit is capable of handling the load of the RouteFinder. Refer to the power label on the equipment for load requirements.
- Maximum ambient temperature for the RouteFinder is 50 degrees Celsius (120° F).
- This equipment should only be installed by properly qualified service personnel.
- Only connect like circuits. In other words, connect SELV (Secondary Extra Low Voltage) circuits to SELV circuits and TN (Telecommunications Network) circuits to TN circuits.

### Shutdown Caution

Never unplug the RouteFinder power until after you have performed the Shutdown process. If the RouteFinder is not properly shut down before unplugging the Power, the next startup may take a little longer, or in the worst case, data could be lost.



## Ship Kit Contents

The RouteFinder is shipped with the following:

- One Multi-Tech Systems, Inc. RouteFinder
- One external power supply with AC power cord
- RJ-45 Ethernet cable
- One printed Quick Start Guide
- Two rack mounting brackets and four mounting screws.
- One RouteFinder documentation CD which contains documentation, license agreements, Adobe Acrobat Reader, and license keys.
- A 30-day evaluation copy of VPN client software on CD (not the full working version).
- One RouteFinder Software Recovery CD.

**Warning:** Do not use the Software Recovery CD for any purpose except for re-installing software onto the RouteFinder hard drive.

**Note:** If any of these items are missing, contact Multi-Tech Systems or your dealer or distributor. Inspect the contents for signs of any shipping damage. If damage is observed, do not power up the RouteFinder; contact Technical Support at Multi-Tech Systems, Inc. for advice.

## License Keys

Where to Find the License Key Numbers

**License Key numbers are printed on labels that are placed:**

- On the bottom of the RouteFinder chassis
- On the compact flash drive inside the chassis
- On the front cover of the Quick Start Guide.

### System License Key

Each RouteFinder ships with a unique individual system License Key, a 20-digit alphanumeric number.

You can view License Key information from the RouteFinder's Web Management software at **Administration > License Key**. This screen shows the entered License Key number and indicates whether it is a valid License Key number.

The License Key number is tied to and tracked with your RouteFinder's serial number. Whenever you require additional licenses, you must first provide Multi-Tech with your current License Key and serial number information in order for us to update your RouteFinder. With a valid License Key, you are entitled to use Multi-Tech's Update service and support.

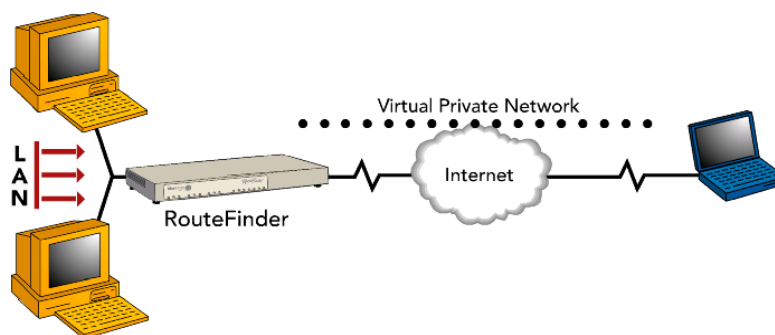
**Note:** The system key is already entered into the VPN setup.

### AntiVirus License Key

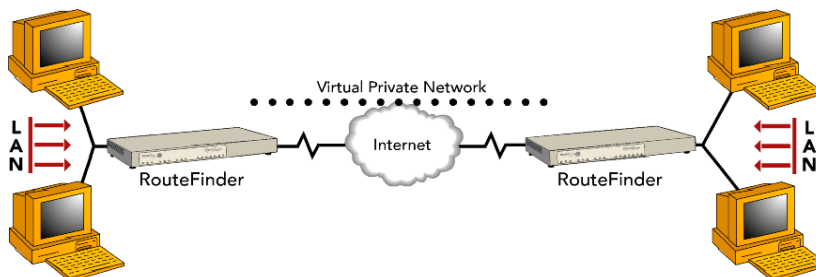
AntiVirus software with its corresponding License Key is available as a special purchase from Multi-Tech.

## Typical Applications

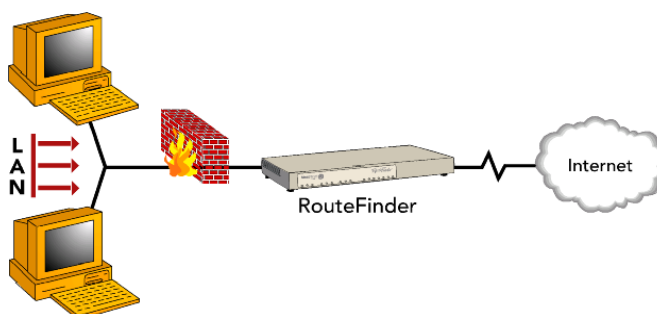
**Remote User VPN.** The client-to-LAN VPN application replaces traditional dial-in remote access by allowing a remote user to connect to the corporate LAN through a secure tunnel over the Internet. The advantage is that a remote user can make a local call to an Internet Service Provider, without sacrificing the company's security, as opposed to a long distance call to the corporate remote access server.



**Branch Office VPN.** The LAN-to-LAN VPN application sends network traffic over the branch office Internet connection instead of relying on dedicated leased line connections. This can save thousands of dollars in line costs and reduce overall hardware and management expenses.



**Firewall Security.** As businesses shift from dial-up or leased line connections to always-on broadband Internet connections, the network becomes more vulnerable to Internet hackers. The RouteFinder provides a full-featured firewall based on Stateful Packet Inspection technology and NAT protocol to provide security from intruders attempting to access the office LAN.



## Specifications

<b>Appliance Features</b>	<b>RF850</b>	<b>RF860</b>
Ethernet Ports	10/100BaseT (LAN, WAN, WAN2/DMZ)	10/100BaseT (LAN, WAN, WAN2/DMZ)
Number of Network Users	50	100
RAM	512MB (can be upgraded to a total of 2GB)	1GB (can be upgraded to a total of 2GB)
Rackmount or Standalone	Both	Both
<b>Firewall Features</b>		
Stateful Packet Inspection	Yes	Yes
Anti-Virus Option	Yes	Yes
Spam Filtering	Yes	Yes
Application Proxies	Yes	Yes
Port and IP Filtering	Yes	Yes
Denial of Service Protection (DoS)	Yes	Yes
Network Address Translation (NAT)	Yes	Yes
Virtual Server	Yes	Yes
Intrusion/Port Scan Detection	Yes	Yes
H.323 Pass Through	Yes	Yes
<b>VPN Features</b>		
Remote User (Client-to-LAN)	Yes	Yes
Branch Office (LAN-to-LAN)	Yes	Yes
3DES/AES Encryption	Yes	Yes
Encryption Throughput	5M	15M
IPSec/PPTP VPN	Yes	Yes
Total Number of Tunnels	50	100
Dynamic-to-Dynamic Tunneling	Yes	Yes
VPN Using FQDN	Yes	Yes
x.509 Certificates	Yes	Yes
<b>Management Features</b>		
Email Alerts	Yes	Yes
Local & Remote Management	Yes	Yes
Logging	Yes	Yes
Reporting	Yes	Yes
Web Based (HTTP, HTTPS/SSL)	Yes	Yes
Secure Shell (SSH)	Yes	Yes
Syslog	Yes	Yes
<b>Other Features</b>		
Shared Internet Access	Yes	Yes
Automatic Dial-Backup	Yes	Yes
Integrated Modem	No	Yes
Dual WAN Load Balancing	Yes	Yes
Internet/VPN Failover	Yes	Yes
High Availability	Yes	Yes
QoS/Bandwidth Allocation	Yes	Yes
PPPoE	Yes	Yes
DHCP Client/Server	Yes	Yes
User Authentication (Web Access)	Yes	Yes
Live Updates	Yes	Yes
Warranty	2 Years	2 Years

<b>Power &amp; Physical Description</b>	<b>RF850</b>	<b>RF860</b>
Power - Voltage & Frequency	100-240v AC, 50-60 Hz	100-240v AC, 50-60 Hz
Power Consumption	42 Watts +12Vdc @ 3.5A	42 Watts +12Vdc @ 3.5A
Physical Description	Dimensions: 12" w x 1.75" h x 8" d; (30.4cm x 4.45cm x 20.3cm) Weight: 4.4 lbs. (2.0 kg)	Dimensions: 12" w x 1.75" h x 8" d; (30.4cm x 4.45cm x 20.3cm) Weight: 4.6 lbs. (2.1 kg)
Operating Environment	Temperature Range: 32° to 120° F (0-50°C) Humidity: 25-85% noncondensing	Temperature Range: 32° to 120° F (0-50°C) Humidity: 25-85% noncondensing
Approvals	FCC Part 68 FCC Part 15 (Class A) CE Mark UL60950	FCC Part 68 FCC Part 15 (Class A) CE Mark UL60950

# Chapter 2 – Installation and Setup

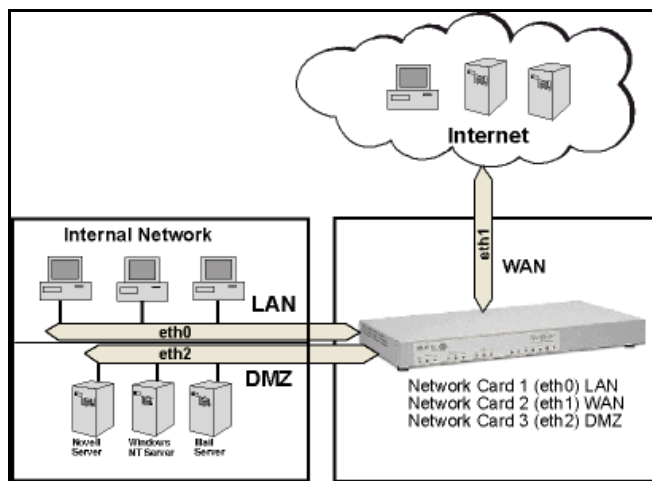
## System Administrator Planning

- The system administrator must complete these setup requirements before installing the RouteFinder software:
- Set the correct configuration of the Default Gateway
- Install an HTTPS-capable browser (e.g., the latest version of Microsoft Internet Explorer or Netscape Navigator)
- Activate JavaScript and Cascading Style Sheets
- Make sure that no proxies are entered in the browser
- If Secure Shell (SSH) is to be used, you must install an SSH client program (e.g., PuTTY in Windows or the bundled SSH client in most Linux packages).

## Planning the Network

Before you begin the installation process, you should plan your network and decide which computer is to have access to which services. This simplifies configuration and saves you a lot of time that you would otherwise need for corrections and adjustments.

### RouteFinder Connection between Your Internal Network and the External Network

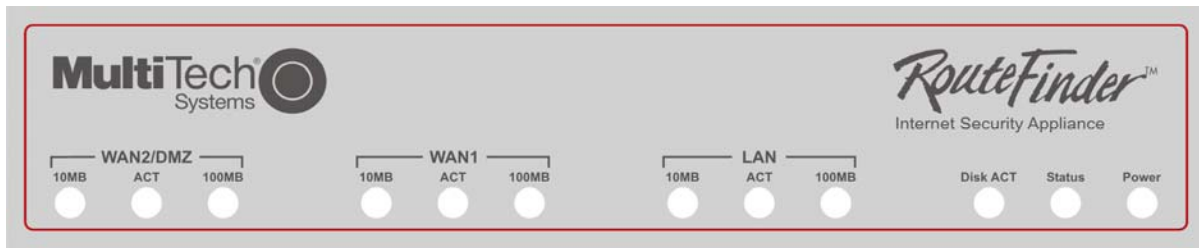


## Establishing an Address Table

Enter your configuration information into the appropriate field of the Address Table below. You can use this table to keep track of your specific RouteFinder and network information (e.g., the IP address used, email lists, etc.) and keep for future reference.

	IP Address	Net Mask	Default Gateway
Network Card connected to the internal network (LAN on eth0)	____.____.____.____	____.____.____.____	
Network Card connected to the external network (WAN on eth1)	____.____.____.____	____.____.____.____	____.____.____.____
Network Card connected to the WAN2 / DMZ (eth2)	____.____.____.____	____.____.____.____	

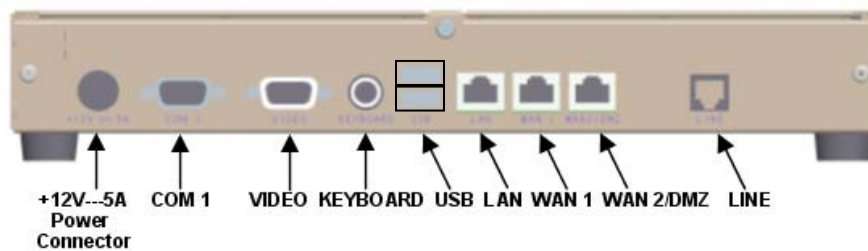
## Front Panel



LEDs	Description
<b>10MB</b>	<b>WAN1, WAN2/DMZ</b> Lights when a successful 10Base-T Internet connection is established. <b>LAN</b> Lights when a successful 10Base-T Ethernet connection is established.
<b>ACT</b>	<b>WAN1, WAN2/DMZ</b> Blinks when it is receiving or transmitting data. <b>LAN</b> Blinks when it is receiving or transmitting data.
<b>100MB</b>	<b>WAN1, WAN2/DMZ</b> Lights when a successful 100Base-T Internet connection is established. <b>LAN</b> Lights when a successful 100Base-T Ethernet connection is established.
<b>Disk ACT</b>	Lights when the disk drive is accessed.
<b>Status</b>	When functioning normally, the LED blinks. The LED is a solid light when the RouteFinder is booting up, saving the configuration, restarting, or updating the firmware.
<b>Power</b>	Lights when power is being supplied to the RouteFinder.

## Cabling Procedure

Make the proper connections as illustrated in this drawing of the RouteFinder back panel.



### Basic Connections

1. Using an RJ-45 Ethernet cable, connect the **LAN** jack to a PC, internal network switch, or hub.  
**Note:** Use a cross-over Ethernet cable if connecting to a single device.
2. Using an RJ-45 Ethernet cable, connect the **WAN 1** jack to a cable modem or DSL modem connected to an Internet Service Provider.
3. Using the supplied **POWER** cord, plug one end into the RouteFinder power plug, and the other end into a live power outlet.  
**Note:** The status LED blinks continuously after power-up.
4. Wait for the RouteFinder to beep five times, indicating that it is ready to be configured with a Web browser. This may take two or three minutes.

### Optional Connections

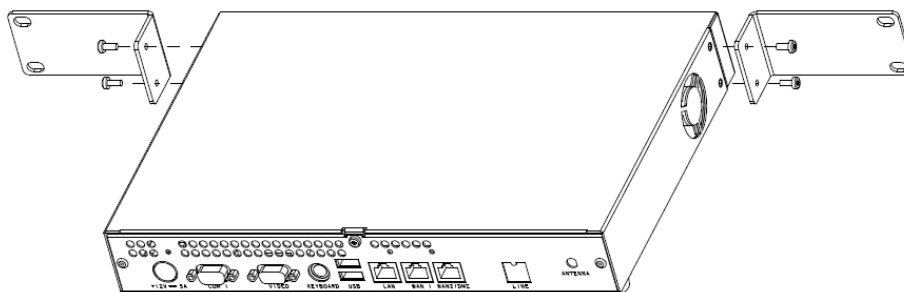
1. Using an RJ-45 Ethernet cable, connect the **WAN2 / DMZ** jack to a network or **DMZ** device. For example, a Voice over IP gateway.
2. Using a DB-9 cable, connect **COM 1** port to a mouse or the **COM** port on a PC.
3. Using a DB-15 DSUB cable, connect the **VIDEO** port to a monitor.
4. Connect the Keyboard jack to a keyboard.
5. Using a USB connector, connect a memory stick, a floppy drive, a CD-ROM drive, a keyboard, mouse, etc.

## Rackmount Bracket Installation

The RouteFinder is shipped with two rackmount brackets and four rackmount screws for installing the RouteFinder VPN into an industry-standard EIA 19-inch rack.

**Note:** The rackmount screws provided in this kit are included for the purpose of attaching the brackets to the RouteFinder as shown below. It is up to you to provide the bracket-to-rack mounting screws.

Use the rack manufacturer's documentation and procedures to safely and securely install the RouteFinder into the rack.



**RouteFinder Shown from the Back**

## Setting up a Workstation and Starting the RouteFinder

This section of the Quick Start covers the steps for setting up TCP/IP communication on the PC(s) connected to the RouteFinder, starting up the RouteFinder, and opening the RouteFinder Web Management program.

### Establish TCP/IP Communication

The RouteFinders have built-in DHCP server functionality, so you can set the PC to obtain a dynamic IP address. The following directions are for Windows 2000+/XP operating systems.

#### *Set a Fixed IP Address*

To set a Fixed IP Address, check **Specify an IP address** instead of **Obtain an IP address automatically**. Then click **OK**.

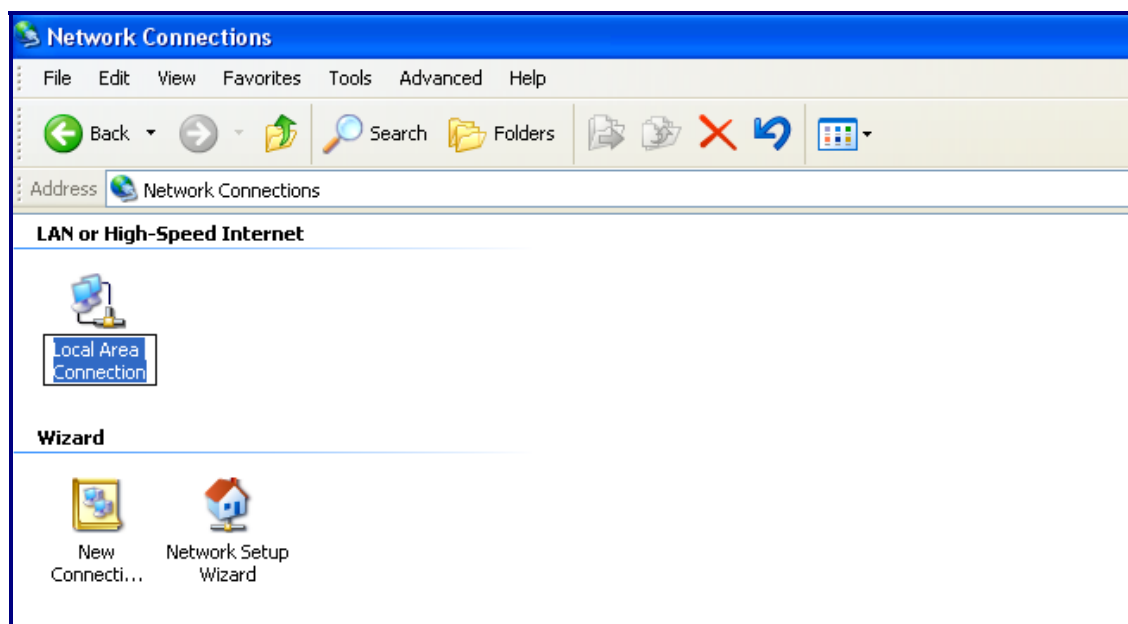
1. Enter the workstation IP address as **192.168.2.x**. Note that the **x** in the address stands for numbers 101 and up.
2. Enter the Subnet mask as 255.255.255.0
3. Enter the Default gateway as 192.168.2.1
4. Close out of the Control Panel.
5. Repeat these steps for each PC on your network.

OR

#### *Obtain a Dynamic IP Address*

To obtain a dynamic IP address so it can be assigned to the Ethernet port:

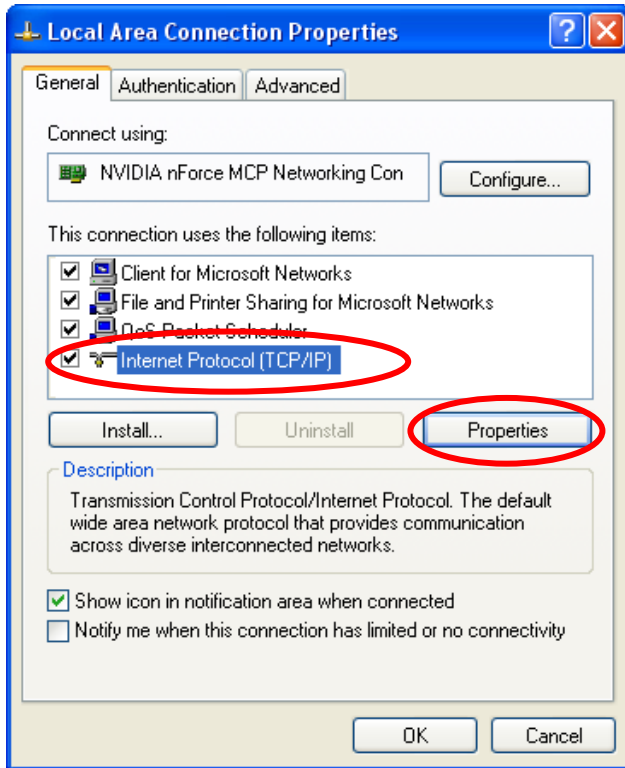
1. Make the RouteFinder connections as described on the previous two pages.
2. Click **Start | Settings | Control Panel**. Double-click the **Network Connections** icon.
3. The **Network Connections** screen displays. Right-click the **Local Area Connection** icon and choose **Properties** from the drop down list.



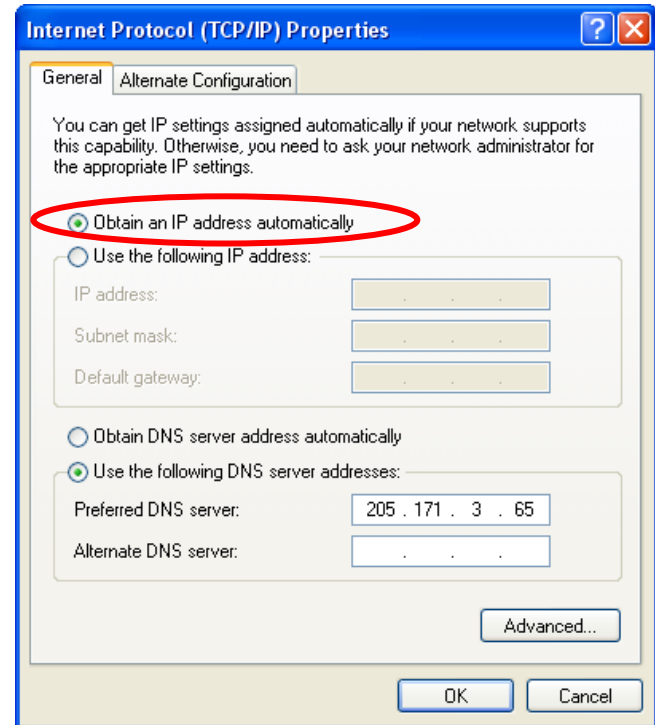


4. The **Local Area Connection Properties** dialog box displays.

- Select **Internet Protocol [TCP/IP]**.
- Click the **Properties** button.



5. Once you click the Properties button, the following screen displays. To have your DHCP client obtain a dynamic IP address, click the button for **Obtain an IP address automatically**.



6. Close out of the Control Panel.
7. Repeat these steps for each PC on your network.

## Open a Web Browser

**Note:** Be sure that the RouteFinder is cabled and that the power is connected. See the cabling drawings at the beginning of this chapter.

Bring up a Web browser on the workstation.

1. Type the default Gateway address: **https://192.168.2.1**
2. Press Enter



**IMPORTANT:** Be sure to type https (http will not work).

**Note:** Make sure your PC's IP address is in the same network as the router's IP address.

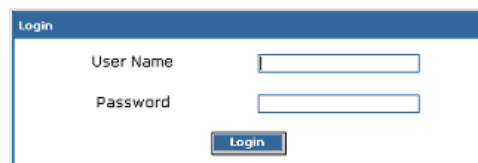
IPCONFIG is a tool for finding a computer's default gateway and MAC address.

In some environments, one or more Security Alert screen(s) may display. At the following Security Alert screen, click Yes and follow any additional on-screen prompts.



## Login

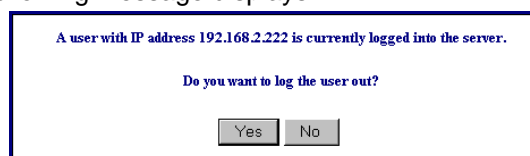
The **Login** screen displays after you type the default Gateway address:



- Type the default User name: admin (all lower-case)
- Tab to the Password field and type the default password: admin (all lower-case).
- Click the Login button.

**Note: User name** and **Password** entries are case-sensitive (both must be typed in lower-case). A password can be up to 12 characters. If Windows displays the **AutoComplete** screen, you may want to click **No** to tell Windows OS to not remember the password for security reasons.

- **Password Caution:** Use a safe password! Your first name spelled backwards is not a sufficiently safe password; a password such as xT35\$4 is better. It is recommended that you change the default password. Create your own password.
- If someone else is already logged into the RouteFinder or you were logged in recently, the following message displays.



Click **Yes**. (If you click **No**, you are returned to the Login screen.)

## Web Management Software Opens

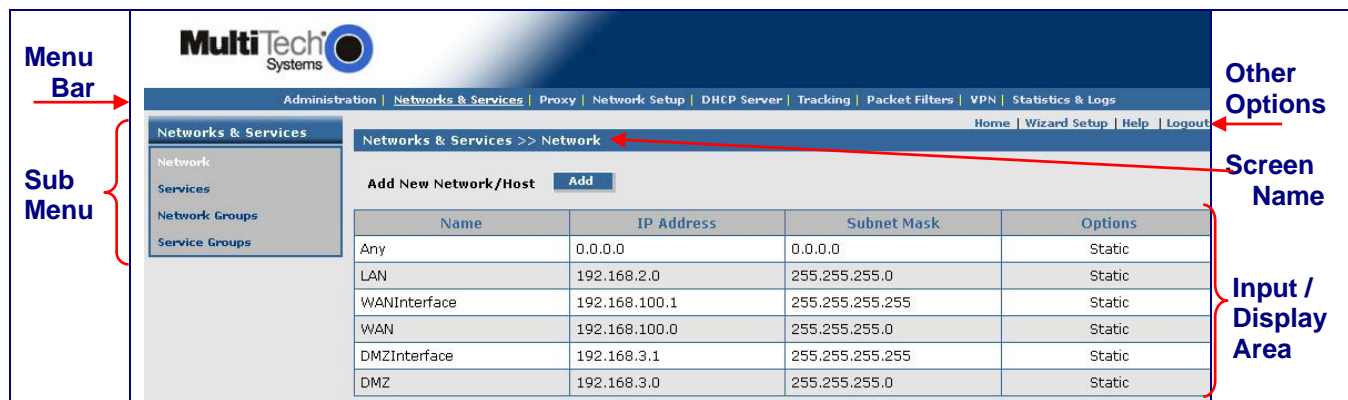
The Web Management software Home screen displays.  
This software is factory-installed on your RouteFinder.



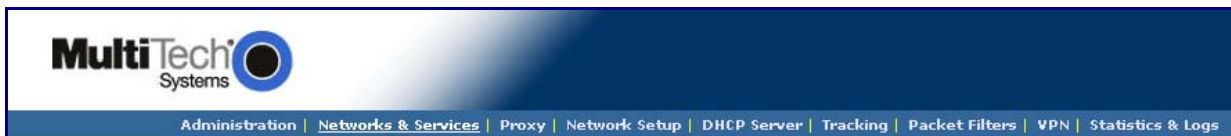
(This is a view of the top part of the Home screen.)

A description of the Web Management software continues in Chapter 4.  
Before using the software, you may find the following information about navigating the screens and the structuring of the menus helpful.

## Navigating Through the Software Screens



### RouteFinder Menu Bar



### Sub-Menu

Each item on the Menu Bar has its own sub-menu, which displays on the left side of the screen. When you click one of the Menu Bar buttons, the first sub-menu option displays. You can choose other sub-menu screens by clicking the screen name in the sub-menu list.

This is an example of the **Networks & Services** sub-menu.



## Screen Buttons

<b>Home</b>	The main screen.
<b>Wizard Setup</b>	Change passwords and quickly set up your RouteFinder with the basic configuration that will set it up as a firewall.
<b>Help</b>	Describes what to do on each screen.
<b>Logout</b>	Logout and return to the login screen.

## Menus and Sub-Menus

Administration	Networks & Services	Proxy	Network Setup	DHCP Server
System Setup SSH SNTP Client Administrative Access Change Root Password Site Certificate License Key Intrusion Detection Tools System Scheduler Factory Defaults User Authentication Local Users Radius & SAM Version Information Restart Shutdown	Networks Services Network Groups Service Groups	HTTP Proxy Custom Filters SMTP Proxy SMTP SPAM Filtering POP3 Proxy POP3 SPAM Filtering Advanced Configurations SOCKS Proxy DNS Proxy	Interface PPP PPPoE DHCP Client Dynamic DNS Routes Masquerading SNAT DNAT Load Balancing High Availability	Subnet Settings Fixed Addresses
Tracking	Packet Filters	VPN	Statistics & Logs	
Accounting Update Services Backup Version Control	Packet Filter Rules ICMP Advanced Enable/Disable Log QoS	IPSec X.509 Certificates IPSec Bridging PPTP	Uptime Hardware Networks Interfaces SMTP Proxy Accounting Self Monitor IPSec PPTP Packet Filter Port Scans View Logs HTTP Access DHCP SMTP Virus Quarantine POP3 Virus Quarantine SMTP Spam Quarantine Administrative Authentication Log QoS DDNS	

# Chapter 3 – Configuration Using Web Management Software

## Initial Configuration Step

### Set Up Your Time Zone

- Click **Administration** on the Menu Bar. The **System Setup** screen displays.
- Set the following:
- Set **System Time** by selecting your **Time Zone**
- Set the current **Day, Month, Year, Hour, and Minute**

**Administration**

**System Setup**

Submenu and first screen listed on the submenu (System Setup) display when you click on your Menu choice (Administration)

**System Time**

**MultiTech Systems**

Administration | Networks & Services | Proxy | Network Setup | DHCP Server | Tracking | Packet Filters | VPN | Statistics & Logs

Home | Wizard Setup | Help | Logout

**Administration >> System Setup**

**E-Mail Notification**

E-Mail Address:  Save Delete

admin@yourdomain.com

**Configure E-Mail Notification:**

Don't Send E-Mail Notification for	Action	Send E-Mail Notification for
Export Backup	Add >>	Invalid Web Login
File Intrusion Detected	<< Delete	Invalid SSH Login
High CPU/RAM usage		Virus Key will Expire
Disk Clean Up - Low Diskspace		Virus Key Expired
System Key Expired		URL Filtering Key Expired

**System Logging**

Logging Status: ☐

Type of Logging: ☒ Local ☐ Remote

Remote Syslog Host IP Address:  Save

Clean Current & Backup Logs: Clean

**System Time**

Time Zone: America:Mexico\_City Save

Day: 07 Save

Month: April

Year: 2006

Hour: 09

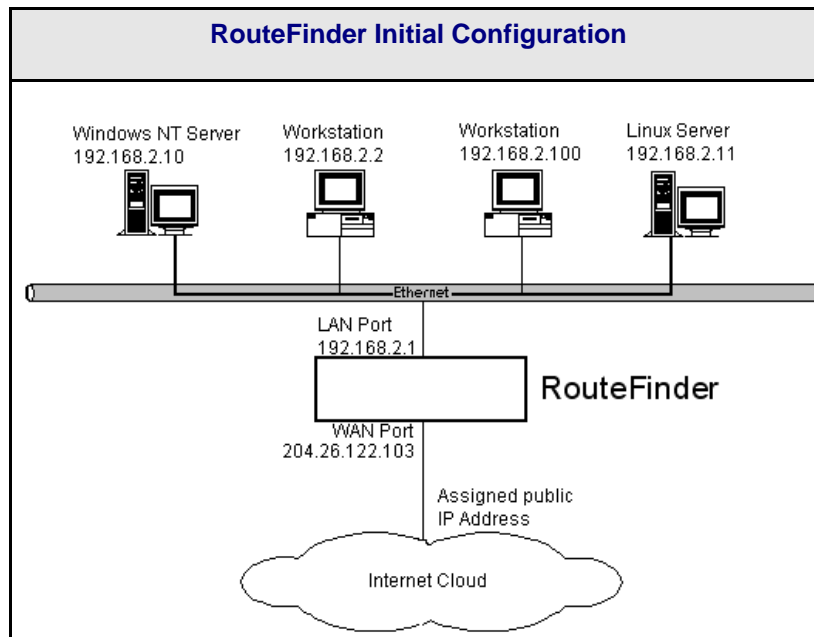
Minute: 08

## Second Configuration Step – Using the Wizard Setup

Using the Wizard Setup is a quick way to enter the basic configuration parameters to allow communication between the LAN's workstation(s) and the Internet as shown in the example below.

**Important Note:** An initial configuration must be completed for each type of RouteFinder functions: firewall configuration, LAN-to-LAN configuration, a LAN-to-Remote Client configuration.

**Note about License Agreements:** It is suggested that you read the legal information and license agreements before beginning the configuration. This information can be found in the RouteFinder User Guide on the RouteFinder CD.



## The Wizard Setup Screen – Configuration Example

Click on the **Wizard Setup** button located under the Menu Bar. The Wizard Setup screen displays. The screen establishes the firewall setup and can be used to enter initial data for other setups.

The Wizard Setup screen is divided into several sections for configuration:

- General Settings:**
  - Administrator Mail Address:
  - Hostname:
- LAN Settings:**
  - LAN IP Address:
  - Subnet Mask:
- WAN Settings:**
  - WAN IP Address:
    - ☒ Static IP Address
    - ☐ PPPoE
    - ☐ DHCP Client
  - WAN IP Address:
  - Subnet Mask:
  - Gateway:
  - DNS IP Address:
- Modem Settings:**
  - PPP dial backup: ☐
- Password Settings:**
  - root Password:
  - Confirm root Password:
  - Webadmin Password:
  - Confirm Webadmin Password:
  - SSH admin Password:
  - Confirm SSH admin Password:
- Packet Filter rule:**
  - ☒ LAN -- ANY -- ANY -- ACCEPT

At the bottom right, there are **Save** and **Cancel** buttons.

1. Enter your **Administrator Email Address** (can be anything). Example: [admin@yourdomain.com](mailto:admin@yourdomain.com)
2. Enter your **Hostname** for the RouteFinder (can be anything).  
Example: RouteFinder.domainname.com
3. **LAN IP Address** and **Subnet Mask** default into the fields. These should be acceptable for your site.
4. Enter the **WAN IP Address**. This is the PUBLIC STATIC IP address.  
Set this option based on information provided by your ISP. Example: 204.26.122.103
5. Change the **Gateway IP** address. This is the IP address of the router that connects to the Internet.  
Example: 204.26.122.1
6. Place a checkmark in the **Packet Filter Rule LAN-ANY-ANY-ACCEPT** box to enable the rule.
7. Change **Password Settings** as appropriate for your network. It is highly recommended that you change all default passwords. Do not leave them at the defaults for security reasons.
8. Click **Save** to save the settings you just entered.
9. The following message displays. Click **OK** to close the message box and save your changes.

*Click OK to save the changes. Please be patient. Setup will take a few minutes to implement the changes. Do not close the Browser.*

Click **OK** to close the message box and save your changes.

10. One more message displays. Note that saving your settings will take 1-2 minutes.

*Please do not close the browser. Server is saving the values. After a few minutes you will be redirected to the new IP address. If you are not redirected, change the address in the location bar to 192.168.2.1.*

11. Test your workstation to see that it can access the Internet. If a connection is established, then the settings have been entered correctly.

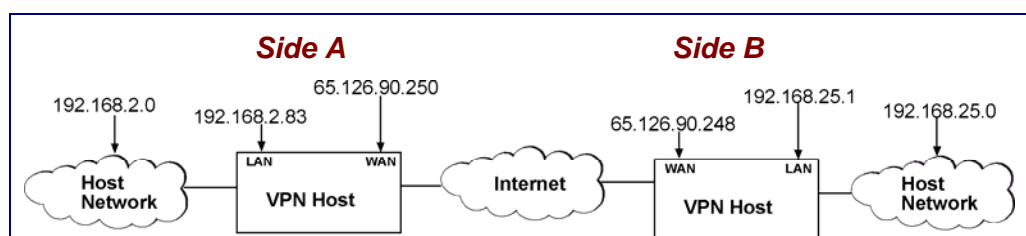
**Your Basic Configuration Is Now Complete.**

# Chapter 4 – Configuration Examples

These examples show how to configure the RouteFinder using the entire Web Management software program. The Wizard Setup utility provides a basic firewall connection, while the Web Management software allows you to configure VPN features, management features, and other options (see the menu outline in Chapter 2).

## Example 1 – Setup Two RouteFinders

The example can be used for a LAN-to-LAN (branch office) setup. It requires two RouteFinders - one in the home office and one in the remote branch office and requires additional parameters beyond the Wizard Setup to be entered.



## RouteFinder Setup – Side A

### Networks & Services > Networks Setup

1. Log in to your RouteFinder software and go to **Networks & Services > Network** Configuration screen.
2. Click the **Add** button to open the fields for entering your network information.
3. Create a new network name for the Remote WAN by entering a **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** Remote-WAN  
**IP Address:** 65.126.90.248  
**Subnet Mask:** 255.255.255.255
4. Create a new network name for the Remote LAN by entering a **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** Remote-LAN  
**IP Address:** 192.168.25.0  
**Subnet Mask:** 255.255.255.0
5. Click **Add** to add the network to the list.

Networks & Services >> Network			
Add New Network/Host		<input type="button" value="Add"/>	
Name	IP Address	Subnet Mask	Options
Any	0.0.0.0	0.0.0.0	Static
LAN	192.168.2.0	255.255.255.0	Static
WANInterface	192.168.100.1	255.255.255.255	Static
WAN	192.168.100.0	255.255.255.0	Static
DMZInterface	192.168.3.1	255.255.255.255	Static
DMZ	192.168.3.0	255.255.255.0	Static
Remote-WAN	65.126.90.248	255.255.255.255	<a href="#">Edit</a> <a href="#">Delete</a>
Remote-LAN	192.168.25.0	255.255.255.0	<a href="#">Edit</a> <a href="#">Delete</a>



## Packet Filters > Packet Filter Rules

1. Go to the **Packet Filters > Packet Filter Rules** screen to set the VPN client tunnel rights. The Packet Filter rights established on this screen give the client access across the tunnel to your host network.
2. In the *System Defined Rules* section, uncheck the **Status** box, if a check mark is present when setting up User Defined Rules.
3. In the *Add User Defined Packet Filter Rules* section, click on **From (Host/Networks)** and select the network to be allowed.
4. In this example, select **Remote-WAN**.
5. If you are not restricting the type of Service, select **Any**.
6. If you are not restricting any Network. Click on **To (Host/Network)**, select **Any**.

### Notes:

- If the client is dynamic (unknown), set up a **Remote-WAN Any Any ACCEPT** filter to allow any network to come in.
- You might want to add **LAN Any Any ACCEPT** to the *User Defined Packet Filter Rules*. If you want this rule to be in the first position so that it takes precedence over the *VPN-Client* rule, select the **Move** command, and move this rule to the first position.

Packet Filters >> Packet Filter Rules

Show Packet Filter Rules

Show Packet Filter Rules in Popup Window Show

System Defined Rules

Status	From	Service Group	To	Action	Remarks
<input type="checkbox"/>	LAN/DMZ	default_outbound	WAN	ACCEPT	Allow Outbound Access

Add User Defined Packet Filter Rules

From (Host/Networks) Service/Service Group To (Host/Networks) Action

Any Any Any ACCEPT Add

No.	From (Host/Networks)	Service/Service Group	To (Host/Networks)	Action	Command
1	LAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>
2	Remote-WAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>
3	Remote-LAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>

## VPN Setup

1. Go to the **VPN > IPSec** screen.
2. Click the **VPN Status** check box to enable IPSec. Then click the **Save** button.
3. Select **Add IKE Connection** by clicking the corresponding **Add** button.

VPN >> IPSec

IPSec

VPN Status ☒ Save

Add New Connection

Add IKE Connection Add

Add Manual Connection Add

Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
--------	-----------------	--------------	-----------	-------------------	------------	---------

## VPN Setup (Continued)

The **Add IKE Connection** screen displays. All settings can be left at the default unless otherwise indicated:

1. **Connection Name:** Enter in the name of the VPN tunnel you want to create.  
Example: Test-Tunnel
2. **Secret:** Enter a Secret password (which has to match on both ends of the tunnel). For this example, enter **test**.
3. **Select Encryption:** Select **3DES**.
4. **Local WAN IP:** Select **WAN**.
5. **Local LAN:** Select **LAN**.
6. **Remote Gateway IP:** Select **Remote-WAN**. (select **ANY** if unknown)
7. **Remote LAN:** Select **Remote-LAN**.
8. Click the **Save** button to save your tunnel.

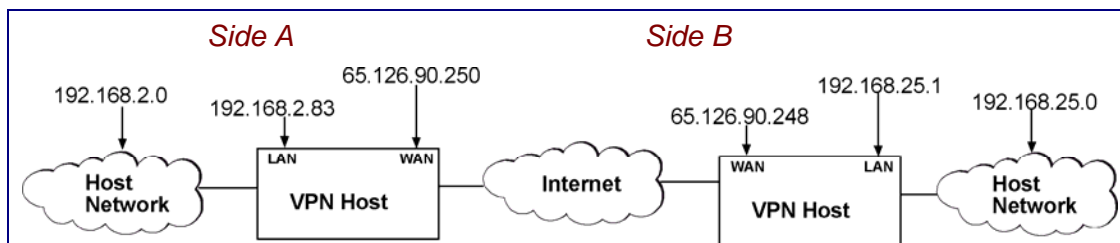
The **VPN > IPSec** Status screen displays; this time showing the newly-created VPN tunnel.

Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
<input checked="" type="checkbox"/>	Test-Tunnel	WAN	LAN	Remote-WAN	Remote-LAN	<a href="#">Edit</a> <a href="#">Delete</a>

### Important Note:

Make sure to check the Status box for this VPN tunnel in order to activate it.

## RouteFinder Setup – Side B



### Networks & Services > Network

1. Log in to your RouteFinder software and go to **Networks & Services > Network Configuration** screen.
2. Click the **Add** button to open the fields for entering your network information.
3. Create a new network name for the Remote LAN by entering a **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** Remote-LAN  
**IP Address:** 192.168.2.0  
**Subnet Mask:** 255.255.255.0
4. Click **Add** to add the network to the list.
5. Create a new network name for the Remote WAN by entering a **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** Remote-WAN  
**IP Address:** 65.126.90.250  
**Subnet Mask:** 255.255.255.255
6. Click **Add** to add the network to the list

**Note:** The same address/mask pair should not be present in the current list displayed on the screen.

Networks & Services >> Network			
Add New Network/Host		<a href="#">Add</a>	
Name	IP Address	Subnet Mask	Options
Any	0.0.0.0	0.0.0.0	Static
LAN	192.168.25.0	255.255.255.0	Static
WANInterface	192.168.100.1	255.255.255.255	Static
WAN	192.168.100.0	255.255.255.0	Static
DMZInterface	192.168.3.1	255.255.255.255	Static
DMZ	192.168.3.0	255.255.255.0	Static
Remote-WAN	65.126.90.250	255.255.255.255	<a href="#">Edit</a> <a href="#">Delete</a>
Remote-LAN	192.168.2.0	255.255.255.0	<a href="#">Edit</a> <a href="#">Delete</a>

## Packet Filters > Packet Filter Rules

1. Go to the **Packet Filters > Packet Filter Rules** screen to set the VPN client tunnel rights. The Packet Filter rights established on this screen give the client access across the tunnel to your host network.
2. In the *System Defined Rules* section, uncheck the **Status** box, if a check mark is present when adding *User Defined Packet Filter Rules*.
3. In the *Add User Defined Packet Filter Rules* section, click on **From (Host/Networks)** and select the network to be allowed.

In this example, select **Remote-LAN**.

4. If you are not restricting the type of service, select **Any**.
5. If you are not restricting what network. Click on **To (Host/Network)**, select **Any**.

### Notes:

- If the client is dynamic (unknown), set up a **Remote-LAN Any Any ACCEPT** filter to allow any network to come in.
- You will need to add **LAN Any Any ACCEPT** to the *User Defined Packet Filter Rules*. If you want this rule to be in the first position so that it takes precedence over the *VPN-Client* rule, select the **Move** command, and move this rule to the first position.

**Packet Filters >> Packet Filter Rules**

**Show Packet Filter Rules**

Show Packet Filter Rules in Popup Window Show

**System Defined Rules**

Status	From	Service Group	To	Action	Remarks
<input checked="" type="checkbox"/>	LAN/DMZ	default_outbound	WAN	ACCEPT	Allow Outbound Access

**Add User Defined Packet Filter Rules**

From (Host/Networks): **Any** Service/Service Group: **Any** To (Host/Networks): **Any** Action: **ACCEPT** Add

No.	From (Host/Networks)	Service/Service Group	To (Host/Networks)	Action	Command
1	LAN	Any	Any	ACCEPT	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Move</a>
2	Remote-WAN	Any	Any	ACCEPT	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Move</a>
3	Remote-LAN	Any	Any	ACCEPT	<a href="#">Edit</a> <a href="#">Delete</a> <a href="#">Move</a>

## VPN Setup

1. Go to the **VPN > IPSec** screen.
2. Click the **VPN Status** check box to enable IPSec. Then click the **Save** button.
3. Select **Add an IKE Connection** by clicking the corresponding **Add** button.

**VPN >> IPSec**

**IPSec**

VPN Status ☒ Save

**Add New Connection**

Add IKE Connection Add

Add Manual Connection Add

Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
--------	-----------------	--------------	-----------	-------------------	------------	---------

## VPN Setup (Continued)

The **Add an IKE Connection** screen displays. All settings can be left at the default unless otherwise indicated:

1. **Connection Name:** Enter in the name of the VPN tunnel you want to create. Example: Test-Tunnel.
2. **Secret:** Enter the **Secret** password (which has to match on both ends of the tunnel). For this example, enter **test**.
3. **Select Encryption:** Select **3DES**.
4. **Local WAN IP:** Select **WAN**
5. **Local LAN:** Select **LAN**
6. **Remote Gateway IP:** Select **Remote-WAN** (Select **Any** if unknown)
7. **Remote LAN:** Select **Remote-LAN**.
8. Click the **Save** button to save your tunnel.

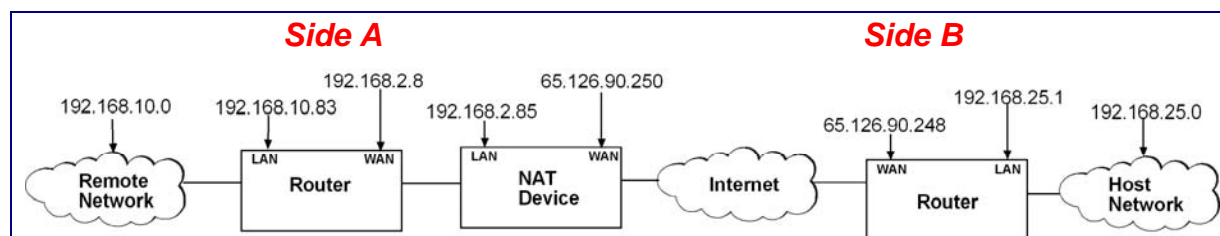
The **VPN > IPSec Status** screen displays; this time showing the newly-created VPN tunnel.

Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
<input checked="" type="checkbox"/>	Test-Tunnel	WAN	LAN	Remote-WAN	Remote-LAN	<a href="#">Edit</a> <a href="#">Delete</a>

### Important Note:

Make sure to check the Status box for this VPN tunnel in order to activate it.

## Example 2 – Set Up Two RouteFinders Behind a NAT Device



### RouteFinder Setup – Side A

#### Networks & Services > Networks

1. Login to your RouteFinder and go to the **Networks & Services > Network Configuration** screen.
2. Click the **Add** button to open the fields for entering the network information.
3. Create a new network name for the RF850-LAN by entering the **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** RF850-LAN  
**IP Address:** 192.168.25.0  
**Subnet Mask:** 255.255.255.0
4. Click the **Add** button to add the new network to the list.
5. Create a new network name for the RF850-WAN by entering the **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** RF850-LAN  
**IP Address:** 65.126.90.248  
**Subnet Mask:** 255.255.255.255
6. Click the **Add** button to add the new network to the list.

Networks & Services >> Network			
Add New Network/Host		<a href="#">Add</a>	
Name	IP Address	Subnet Mask	Options
Any	0.0.0.0	0.0.0.0	Static
LAN	192.168.10.0	255.255.255.0	Static
WANInterface	192.168.2.8	255.255.255.255	Static
WAN	192.168.2.0	255.255.255.0	Static
DMZInterface	192.168.3.1	255.255.255.255	Static
DMZ	192.168.3.0	255.255.255.0	Static
RF850-LAN	192.168.25.0	255.255.255.0	<a href="#">Edit</a> <a href="#">Delete</a>
RF850-WAN	65.126.90.248	255.255.255.255	<a href="#">Edit</a> <a href="#">Delete</a>

## Packet Filters > Packet Filter Rules

1. Go to the **Packet Filters > Packet Filter Rules** screen to set the VPN client tunnel rights. The Packet Filter rights established on this screen give the client access across the tunnel to your host network.
2. In the *System Defined Rules* section, uncheck the **Status** box, if a check mark is present.
3. In the *Add User Defined Packet Filter Rules* section, click on **From (Host/Networks)** and select the network to be allowed.

In this example, select **RF850-LAN**.

4. If you are not restricting the type of service, select **Any**.
5. If you are not restricting what network. Click on **To (Host/Network)**, select **Any**.

### Notes:

- If the client is dynamic (unknown), set up an **RF850-LAN Any Any ACCEPT** filter to allow any network to come in.
- You might want to add **LAN Any Any ACCEPT** to the User Defined Packet Filter Rules. If you want this rule to be in the first position so that it takes precedence over the VPN-Client rule, select the **Move** command, and move this rule to the first position.

**Packet Filters >> Packet Filter Rules**

Show Packet Filter Rules

Show Packet Filter Rules in Popup Window Show

**System Defined Rules**

Status	From	Service Group	To	Action	Remarks
<input type="checkbox"/>	LAN/DMZ	default_outbound	WAN	ACCEPT	Allow Outbound Access

**Add User Defined Packet Filter Rules**

From (Host/Networks): **Any** Service/Service Group: **Any** To (Host/Networks): **Any** Action: **ACCEPT** Add

No.	From (Host/Networks)	Service/Service Group	To (Host/Networks)	Action	Command
1	LAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>
2	RF850-LAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>
3	RF850-WAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>

## VPN Setup

1. Go to the **VPN > IPSec** screen.
2. Click on the **VPN Status** check box to enable IPSec. Then click the **Save** button.
3. Select **Add an IKE Connection** by clicking the corresponding **Add** button.

**VPN >> IPSec**

**IPSec**

VPN Status ☒ Save

**Add New Connection**

Add IKE Connection Add

Add Manual Connection Add

Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
--------	-----------------	--------------	-----------	-------------------	------------	---------

## VPN Setup (Continued)

The **Add IKE Connection** screen displays. All settings can be left at the default unless otherwise indicated:

1. **Connection Name:** Enter a name for the VPN tunnel you want to create. For this example, enter **Behind-NAT**.
2. **Secret:** Enter the **Secret** password (which has to match on both ends of the tunnel). For this example, enter **test**.
3. **Select Encryption:** Select **3DES**.
4. **Local WAN IP:** Select **WAN**.
5. **Local LAN:** Select **LAN**.
6. **Remote Gateway IP:** Select **RF850-WAN**.
7. **Remote LAN:** Select **RF850-LAN**.
8. **UID:** Click the **Enable** button (must be enabled when using NAT).
9. **Local ID:** Enter the local security gateway ID (required when using NAT). For this example, enter 192.168.2.8
10. **Remote ID:** Enter the remote security gateway ID (required when using NAT). For this example, enter 65.126.90.248
11. Click the **Add** button to save your tunnel.

The **VPN > IPsec Status** screen displays; this time showing the newly-created VPN tunnel.

### Important Note:

Make sure to check the Status box for this VPN tunnel in order to activate it.

VPN >> IPSec

IPSec

VPN Status

☒

Save

Add New Connection

Add IKE Connection

Add

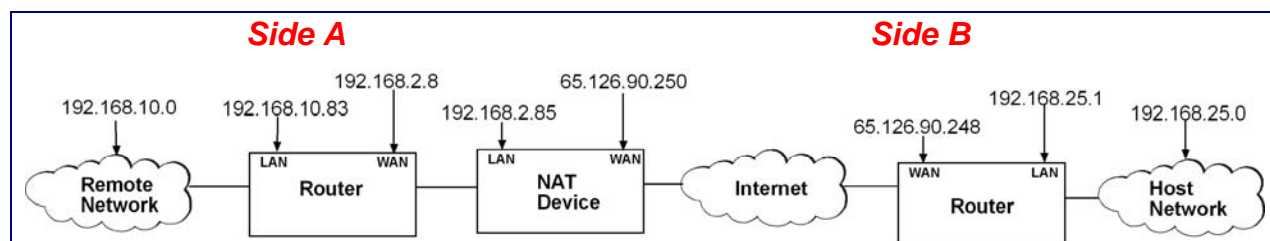
Add Manual Connection

Add

Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
<input checked="" type="checkbox"/>	Behind-NAT	WAN	LAN	RF850-WAN	RF850-LAN	<a>Edit</a> <a>Delete</a>



## RouteFinder Setup – Side B



### Network & Services > Network

- Log into your RouteFinder and go to the **Networks & Services > Network Configuration** screen.
- Click the **Add** button to open the fields for entering your network information.
- Create a new network name for the RF850-WAN by entering the **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** RF850-WAN  
**IP Address:** 65.126.90.250  
**Subnet Mask:** 255.255.255.255
- Click the **Add** button to add the new network to the list.
- Create a new network name for the RF850-LAN by entering the **Name**, **IP Address**, and **Subnet Mask**. For this example, enter the following:  
**Name:** RF850-LAN  
**IP Address:** 192.168.10.0  
**Subnet Mask:** 255.255.255.0
- Click the **Add** button to add the new network to the list.

Networks & Services >> Network			
Add New Network/Host		<a href="#">Add</a>	
Name	IP Address	Subnet Mask	Options
Any	0.0.0.0	0.0.0.0	Static
LAN	192.168.25.0	255.255.255.0	Static
WANInterface	65.126.90.248	255.255.255.255	Static
WAN	65.126.90.0	255.255.255.0	Static
DMZInterface	192.168.3.1	255.255.255.255	Static
DMZ	192.168.3.0	255.255.255.0	Static
RF850-LAN	192.168.10.0	255.255.255.0	<a href="#">Edit</a> <a href="#">Delete</a>
RF850-WAN	65.126.90.250	255.255.255.255	<a href="#">Edit</a> <a href="#">Delete</a>

## Packet Filters > Packet Filter Rules

1. Go to the **Packet Filters > Packet Filter Rules** screen to set the VPN client tunnel rights. The Packet Filter rights established on this screen give the client access across the tunnel to your host network.
2. In the *System Defined Rules* section, uncheck the **Status** box, if a check mark is present.
3. In the *Add User Defined Packet Filter Rules* section, click on **From (Host/Networks)** and select the network to be allowed. In this example, select **RF850-WAN**.
4. If you are not restricting the type of service, select **Any**.
5. If you are not restricting what network. Click on **To (Host/Network)**, select **Any**.

### Notes:

- If the client is dynamic (unknown), set up an **RF850-WAN Any Any ACCEPT** filter to allow any network to come in.
- You might want to add **LAN Any Any ACCEPT** to the *User Defined Packet Filter Rules*. If you want this rule to be in the first position so that it takes precedence over the *VPN-Client* rule, select the **Move** command, and move this rule to the first position.

Packet Filters >> Packet Filter Rules

Show Packet Filter Rules

Show Packet Filter Rules in Popup Window Show

System Defined Rules

Status	From	Service Group	To	Action	Remarks
<input type="checkbox"/>	LAN/DMZ	default_outbound	WAN	ACCEPT	Allow Outbound Access

Add User Defined Packet Filter Rules

From (Host/Networks) Any Service/Service Group Any To (Host/Networks) Any Action ACCEPT Add

No.	From (Host/Networks)	Service/Service Group	To (Host/Networks)	Action	Command
1	LAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>
2	RF850-LAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>
3	RF850-WAN	Any	Any	ACCEPT	<a>Edit</a> <a>Delete</a> <a>Move</a>

## VPN Setup

1. Go to the **VPN > IPSec** screen.
2. Click on the **VPN Status** check box to enable IPSec. Then click the **Save** button.
3. Select **Add an IKE Connection** by clicking the corresponding **Add** button.

VPN >> IPSec

IPSec

VPN Status ☒ Save

Add New Connection

Add IKE Connection Add

Add Manual Connection Add

Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
--------	-----------------	--------------	-----------	-------------------	------------	---------

## VPN Setup (Continued)

The **Add IKE Connection** screen displays. All settings can be left at the default unless otherwise indicated:

1. **Connection Name:** Enter the name of the VPN tunnel you want to create. For this example, enter **Behind-NAT**.
2. **Secret:** Enter the **Secret** password (which has to match on both ends of the tunnel). For this example, enter **test**.
3. **Select Encryption:** Select **3DES**.
4. **Local WAN IP:** Select **WAN**.
5. **Local LAN:** Select **LAN**.
6. **Remote Gateway IP:** Select **RF850-WAN**.
7. **Remote LAN:** Select **RF850-LAN**.
8. **UID:** Click the **Enable** button (must be enabled when using NAT).
9. **Local ID:** Enter the local security gateway ID (required when using NAT). For this example, enter 65.126.90.248
10. **Remote ID:** Enter the remote security gateway ID (required when using NAT). For this example, enter 192.168.2.8
11. Click the **Save** button to save your tunnel.

The **VPN > IPsec** Status screen displays; this time showing the newly-created VPN tunnel.

### Important Note:

Make sure to check the **Status** box for this VPN tunnel in order to activate it.

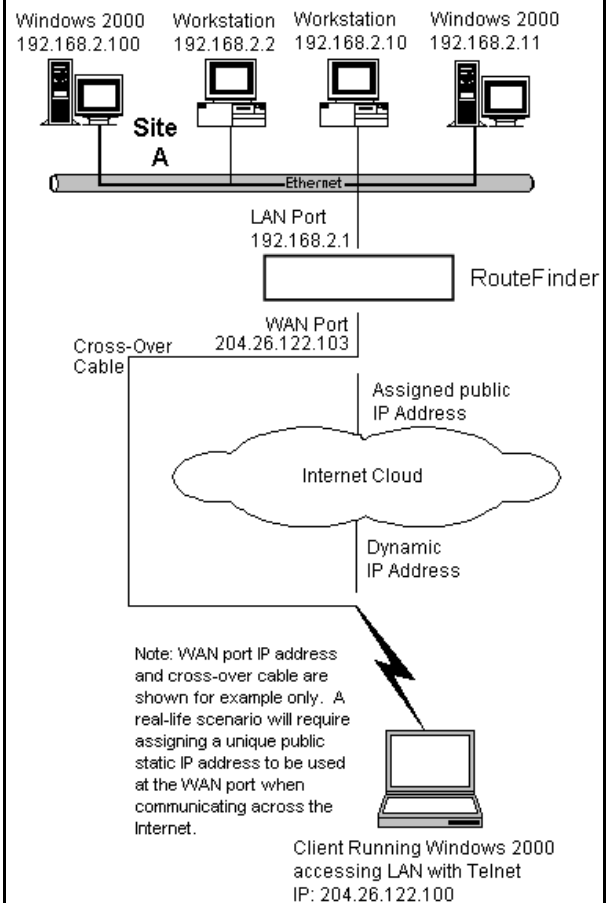
Status	Connection Name	Local Wan IP	Local LAN	Remote Gateway IP	Remote LAN	Command
<input checked="" type="checkbox"/>	Behind-NAT	WAN	LAN	RF850-WAN	RF850-LAN	<a href="#">Edit</a> <a href="#">Delete</a>

## Example 3 – Remote Client-to-LAN Configuration Using DNAT and Aliasing

Use this procedure to configure the RouteFinder with DNAT and Aliasing. This configuration allows a Windows Remote Client to Telnet through the RouteFinder to several Windows Operating Systems located on the LAN.

### Remote Client-to-LAN Configuration Using DNAT and Aliasing Through the RouteFinder

1. **Networks & Services > Network screen**  
 Enter: LAN Network, 192.168.2.0, 255.255.255.0  
 Enter WANInterface1, 204.26.122.103, 255.255.255.255  
 Enter WANInterface2, 210.26.122.104, 255.255.255.255  
 Enter WIN2k\_Pro, 192.168.2.100, 255.255.255.255  
 Enter WIN2k\_Server, 192.168.2.11, 255.255.255.255
2. **Network Setup > Interface screen**  
 Set default gateway at 204.26.122.1  
 Enter a host name (example: RF860.Site-A.com)  
 Enter Network Cards: (Cards 1 & 3 are defaulted)  
 Card 1: LAN (eth0), 192.168.2.1, 255.255.255.0  
 Card 2: WAN (eth1), 204.26.122.103, 255.255.255.0  
 Card 3: DMZ (eth2), 192.168.3.1
3. **Network Setup > Interface > IP Aliases section**  
 Interface: Select *LAN(eth0)*  
 Enter IP Address: 204.26.122.104  
 Enter Net Mask: 255.255.255.255  
 Interface: Select: Select *WAN (eth1)*  
 Enter IP Address: 204.26.122.105  
 Enter Net Mask: 255.255.255.255
4. **Network Setup > DNAT screen**  
 Enter two profiles:  
 Pre DNAT Network: Select *WANInterface1*  
 Pre DNAT Service: Select *Telnet*  
 Post DNAT IP Address: Select *Win2k\_Pro*  
 Post DNAT Service: Select *Telnet*  
 Pre DNAT Network: Select *WANInterface2*  
 Pre DNAT Service: Select *Telnet*  
 Post DNAT IP Address: Select *Win2k\_Server*  
 Post DNAT Service: Select *Telnet*
5. **Packet Filters > Packet Filter Rules screen**  
 Add User Defined Packet Filter Rules  
 LAN – ANY – ANY – Accept  
 ANY – Telnet – Win2k\_Pro – Accept  
 ANY – Telnet – Win2k\_Server – Accept



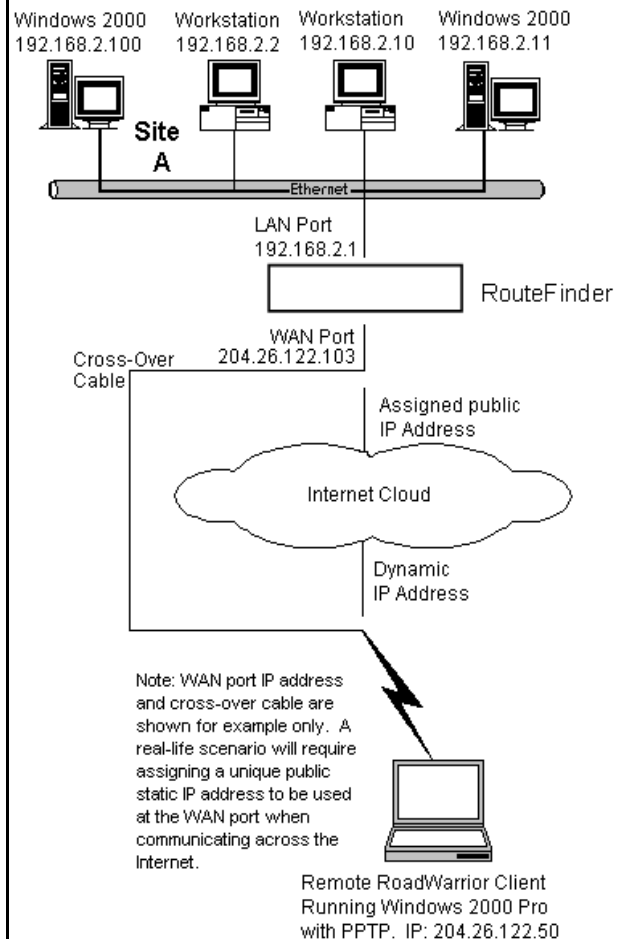
## Example 4 – Client-to-LAN Configuration Using PPTP Tunneling

Use this procedure to configure the RouteFinder as a PPTP server for VPN Remote Client Access. This is also known as the PPTP Roadwarrior configuration.

**Note:** IPX and Netbeui are not supported when using PPTP tunneling.

### Remote Client-to-LAN Configuration Using PPTP Tunneling Through the RouteFinder

1. **Networks & Services > Network screen**  
Enter: LAN Network, 192.168.2.0, 255.255.255.0  
Enter: PPTP-Pool, 192.168.2.240, 255.255.255.240
2. **Network Setup > Interface screen**  
Set default gateway at 204.26.122.1  
Enter a host name (example: RF860.Site-A.com)  
Enter Network Cards: (Cards 1 & 3 are defaulted)  
Card 1: LAN (eth0), 192.168.2.1, 255.255.255.0  
Card 2: WAN (eth1), 204.26.122.103,  
255.255.255.0  
Card 3: DMZ (eth2), 192.168.3.1
3. **Packet Filters > Packet Filter Rules screen**  
Add User Defined Packet Filter Rules  
LAN – ANY – ANY – Accept
4. **VPN > PPTP screen**  
Check the *PPTP Status* box  
Encryption Strength: Select *40* or *128*  
Select Remote Address: Select *PPTP-Pool*  
Click the Save button. The addresses and range display  
Authentication Type: Select *Local*  
Username: Enter user name (example: roadwarrior)  
Password: Enter user password (example:1o2t3t4t)  
Click the Add button.



## Checking the Tunnel

After setting up your RouteFinder, you can check the status of your VPN tunnel by clicking on **Statistics & Logs** and going to the **IPSec Live Log**. You will see the connection up and running (if connected), and you will see the statistics related to the data being sent across the tunnel.

# Chapter 5 – URL Categorization

The Universal Resource Locator (URL) Categorization License Key allows you to set up a URL database that limits clients' access to places on the Internet by blocking sites you do not want accessed. In other words, you can deny users access to various categories of Web sites you select.

## Important Settings

- The RouteFinder must be connected to the Internet for the URL License to be activated.
- With the HTTP proxy functioning in transparent mode, clients are unaware that their Internet requests are being transferred through an HTTP proxy.

## Setting Up HTTP Proxy and URL Filtering

1. Click **Proxy** from the Menu bar. The **HTTP Proxy** screen displays.

### Notes About the HTTP Proxy Screen:

- When this screen initially displays, only the HTTP Proxy **Status** field, its checkbox and **Save** button can be seen.
- More parts of the HTTP Proxy screen display after clicking **Status** and **Save**. Also, the **URL Categorization** section and the **Authentication** section display.
- After clicking and saving **URL Filter** and **User Authentication**, more parts to these screen display as shown below.
- If you check and Save **Transparency**, *User Authentication* is not available. The *Transparency* option is not shown on this screen since it was not checked and *User Authentication* was selected.

**MultiTech Systems**

Administration | Networks & Services | **Proxy** | Network Setup | DHCP Server | Tracking | Packet Filters | VPN | Statistics & Logs

Home | Wizard Setup | Help | Logout

**Proxy**

HTTP Proxy

Custom Filters

SMTP Proxy

SMTP SPAM Filtering

POP3 Proxy

POP3 SPAM Filtering

Advanced Configurations

SOCKS Proxy

DNS Proxy

**Proxy >> HTTP Proxy**

**HTTP Proxy**

Status	<input checked="" type="checkbox"/>	Save
Transparent	<input type="checkbox"/>	Save
Networks (allowed / denied)		Edit
Banner Filter	<input type="checkbox"/>	Save
Java Script Filter	<input type="checkbox"/>	Save
Cookie Filter	<input type="checkbox"/>	Save

**URL Categorization**

URL Filter	<input type="checkbox"/>	Save
------------	--------------------------	------

**Authentication**

User Authentication	<input type="checkbox"/>	Save
---------------------	--------------------------	------

- On the **HTTP Proxy > HTTP** screen (see previous page), check the **Status** box and click **Save**.

**Important Note:** **Status** must be checked before you can enter and activate your URL Categorization License Key.

**Note About URL License Key:** The URL License number must be entered on the **Administration > License Key** screen before the URL Categorization section of this screen displays. The 30-day free trial key number is located on the bottom of the RouteFinder chassis and on the front of the Quick Start Guide.

- Changing Status for the LAN:**

On the **HTTP Proxy > HTTP** screen (see previous page), check the **Add** button across from **Select Networks (allowed / denied)**. The **HTTP Non-Transparent Networks** screen displays:

Proxy >> HTTP Proxy		
HTTP Non-Transparent Networks		
Network/Host	Status	Options
Any	Available	<a href="#">Change Status</a>
LAN	Available	<a href="#">Change Status</a>
WANLINK1Interface	Available	<a href="#">Change Status</a>
WANLINK1	Available	<a href="#">Change Status</a>
WANLINK2Interface	Available	<a href="#">Change Status</a>
WANLINK2	Available	<a href="#">Change Status</a>
		<a href="#">Back</a>

Click **Change Status** for **LAN**. The Change Status for LAN screen displays. Click **Change** and select **Allowed** from the drop down list box:

Proxy >> HTTP Proxy		
Change Status for LAN		
Network Name	Policy	
LAN	Available ▾	<a href="#">Change</a>
Network/Host	Status	Options
Any	Available	<a href="#">Change Status</a>
LAN	Available	<a href="#">Change Status</a>
WANLINK1Interface	Available	<a href="#">Change Status</a>
WANLINK1	Available	<a href="#">Change Status</a>
WANLINK2Interface	Available	<a href="#">Change Status</a>
WANLINK2	Available	<a href="#">Change Status</a>
		<a href="#">Back</a>

This screen shows **LAN** status changed to **Allowed**:

Proxy >> HTTP Proxy		
HTTP Non-Transparent Networks		
Network/Host	Status	Options
Any	Available	<a href="#">Change Status</a>
LAN	Allowed	<a href="#">Change Status</a>
WANLINK1Interface	Available	<a href="#">Change Status</a>
WANLINK1	Available	<a href="#">Change Status</a>
WANLINK2Interface	Available	<a href="#">Change Status</a>
WANLINK2	Available	<a href="#">Change Status</a>
		<a href="#">Back</a>

- URL Filtering:**

On the **HTTP Proxy > HTTP** screen in the **URL Categorization** section, check the **URL Filter** box and click **Save**. These fields are now visible:

**URL Categories (allowed / filtered)** and  
**Networks / Hosts to bypass URL Filtering.**

## 5. URL Categories (Allowed/Filtered)

Click **Edit** for **URL Categories (Allowed/Filtered)**. The following **URL Categories** screen displays. This screen allows you to choose Web site that you want blocked/filtered from users.

Use the **Filter** and **Allow** buttons to move a URL Category from the *URL Categories Allowed* list to the *URL Categories Filtered* or back to the allowed list.

When you are finished organizing the categories, click the **Back** button to go back to the **HTTP > HTTP Proxy** main screen.

### Testing Filtering Using Get URL Category

To test the filtering, type a URL in the **http://** box and click the **Go** button. This will test the URL to see if it is allowed or blocked.

**Note:** You can also test a site through your browser by entering a Web address that you feel should be blocked by the filter through one of the categories you had chosen or a category preset by the URL software. For instance, if you selected the **Finance and Investment** category to be filtered, try to access [www.etrade.com](http://www.etrade.com). This site should be blocked. A message displays under the URL address stating the status of this Web site.

**Important:** The sites listed in the **Favorites** box of the browser will not be blocked unless the cache is emptied in the browser.

## 6. Networks / Hosts to bypass URL Filtering

Return to the **Proxy > HTTP Proxy** main screen. In the **URL Categorization** section, click the **Networks / Hosts to bypass URL Filtering**. The **Networks/Hosts to bypass** screen displays.

- Select a network/host and click the **Add** button to add it to the **Networks/Hosts to bypass URL Filtering**. These networks/hosts will be able to access all sites; URL Category based filtering will not happen for these networks/hosts.
- If you decide you do not want one or more of the networks/hosts bypassing the filter, select the name and click the **Delete** button. The name moves back into the **Available Networks/Host** box.



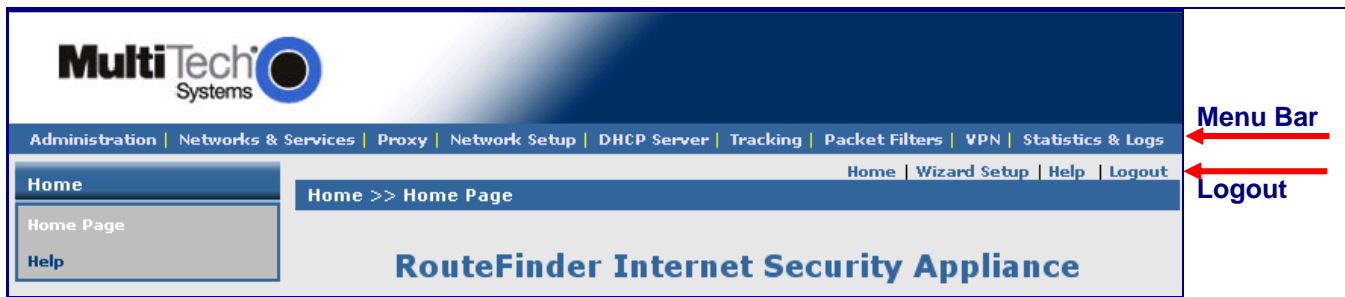
## Chapter 6 – RouteFinder Software

This chapter describes each screen and its function in the RouteFinder software. The aim of the administrator in setting the options in the software should be to let as little as possible and as much as necessary through the RouteFinder, for both incoming as well as outgoing connections.

**Note:** If you have not done so already, plan your network and decide which computers are to have access to various services. This simplifies the configuration and saves you a lot of time that you would otherwise need for corrections and adjustments.

### Menu Bar

The Menu bar provides the organization of this chapter.



### Important Note About Logout

#### *Logout Closes the Software Program and Saves Settings*

The best way to exit WebAdmin is to choose Logout. This will save all your current settings. The browser connection is terminated and you are returned to the **Login** screen. Note that clicking the browser's **Back** button will not effectively return you to the previous menu or directory at this point.

If you close the browser while configuring the RouteFinder, the last session stays active until the end of the time-out, and no new administrator can log in. The timeout period is set at **Administration > Administrative Access > Time Before Automatic Disconnect**.

## Administration

### Administration > System Setup

In **Administration**, you can set the RouteFinder general system-based parameters.

**A Note About This Screen:** When *Logging Status* is **not** checked, the section of the screen *Configure Logging* does not display.

**MultiTech Systems**

Administration | Networks & Services | Proxy | Network Setup | DHCP Server | Tracking | Packet Filters | VPN | Statistics & Logs

Home | Wizard Setup | Help | Logout

**Administration >> System Setup**

**E-Mail Notification**

E-Mail Address:  **Save**

**Delete**

**Configure E-Mail Notification:**

Don't Send E-Mail Notification for	Action	Send E-Mail Notification for
Export Backup	<b>Add &gt;&gt;</b>	Invalid Web Login
File Intrusion Detected	<b>&lt;&lt; Delete</b>	Invalid SSH Login
High CPU/RAM usage		Virus Key will Expire
Disk Clean Up - Low Diskspace		Virus Key Expired
System Key Expired		URL Filtering Key Expired

**System Logging**

Logging Status: ☒

Type of Logging: ☒ Local ☐ Remote

Remote Syslog Host IP Address:  **Save**

Clean Current & Backup Logs: **Clean**

**Configure Logging:**

Disabled Logs	Action	Enabled Logs
SMTP/POP3 Messages	<b>Add &gt;&gt;</b>	Kernel Messages
SNTP/UUCP/FTP Messages	<b>&lt;&lt; Delete</b>	Web Access Messages
IPSec Debug Messages		Boot Messages
IKE Debug Messages		Cron Messages
PPTP Debug Messages		Daemon Messages

**System Time**

Time Zone:  **Save**

Day:  **Save**

Month:

Year:

Hour:

Minute:

#### Email Notification

##### Email Address

Enter the **Email Address** of the administrator who will receive the email notifications. Click **Save**.

You can delete the entry and change it at any time, if desired.

At least one email address must be entered in this field.

**Configure Email Notifications**

Select the types of notifications that you want sent. Click the **Add** button. The name will then appear in the **Send Email Notification For** box. You can remove a type by clicking the **Delete** button. The name will then move back to the **Don't Send Email Notification For** box.

1. Export Backup (the backup file will be attached)
2. File Intrusion Detection (File Integrity Checks and Network Intrusions)
3. High CPU/RAM Usage (Hard disk usage exceeding 70%)
4. Disk Clean Up – Low Diskspace
5. System Key Expired (10 days before expiry)
6. Invalid Web Login
7. Invalid SSH Login
8. Port Intrusion Detected
9. PPP backup link down
10. PPP backup link up
11. URL Filtering Server Error
12. Auto System Update
13. Virus Key Will Expire
14. Virus Key Has Expired
15. Virus Database Updated
16. URL Filtering Key Expired
17. URL Filtering Key Will Expire (10 days, 2 days, and 1 day before expiry)
18. URL Filtering Categories Updated
19. URL Categories Update Failed
20. Bayesian Database Has Reached Maximum
21. POP3 Virus Mail
22. HTTP Access Deny Reports
23. HA Synchronization
24. Backup Logs
25. High Availability Peer Status
26. Load Balancing WANLinks Status

The mail settings are saved in the server configuration. The first email ID in the list should be the Administrator's ID, so that when the first ID is added or deleted, the session is terminated and the Web server restarted.

**System Logging****Logging Status**

Check the **Logging Status** box to activate and enable the host to receive log messages from other machines.

**Local or Remote**

Select the type of logging, either **Local** or **Remote**.

**Remote Syslog Host IP Address**

Enter the IP address of the **Remote Syslog Host** to which all log messages from the RouteFinder will be forwarded. Click **Save**.

**Notes:**

- The IP address is a required parameter.
- On the remote host, syslog should be invoked with the "-r" option to enable the host to receive log messages from other machines. This is especially recommended if you want to collect the log files of several systems on one host. The default setting is 'off'.

**Clean Current and Backup Logs**

Click **Clean** to delete all the current and backup system log files.

**Configure Logging**

Select the types of logs that you want sent. Click the **Add** button. The name will then appear in the **Enabled Logs** box. You can remove a log by clicking the **Delete** button. The name will then move back to the **Disabled Logs** box.

**The drop down box lists:** SMTP/POP3 Messages, SNMP/UUCP/FTP Messages, SMTP Debug Messages, IPsec Debug Messages, IKE Debug Messages, Kernel Messages, Web Access Messages, Boot Messages, Cron Messages, Daemon Messages, and PPTP Debug Messages.

**System Time**

Select the system time, time zone, and current date.

**Note:** We do not recommend changing from summertime to wintertime and back. We suggest entering Greenwich Mean Time (GMT), regardless of your global position, especially if you operate Virtual Private Networks across different time zones. Changing the system time can lead to the following time-warp effects:

**Forward time adjustment (winter to summertime)**

The time-out for the **Web Admin** has expired and your session is not valid anymore.

Log information for some time periods may be missing in the time-based reports.

Most diagrams show this time period as a straight line at the height of the old value.

All the values for Accounting in this time period are 0.

**Backward time adjustment (summer to wintertime)**

The time-based reports already contain log information for the corresponding time period which, as far as the system is concerned, comes from the future: this information is not overwritten, but is retained.

The writing of the log files is continued from the point of time before the setback time is reached.

Most diagrams show the values of this time period as compressed.

The already-recorded data (from the future) retain their validity for the Accounting function.

The accounting files are continued when the setback time is reached again. Therefore, it is recommended that the time should only be set once during initial configuration and later should only be slightly adjusted. No adjustments from wintertime to summertime should be made, especially if the collected reporting and accounting information is to be further processed.

**Administration > SSH****What Is SSH**

SSH (Secure Shell) is a program to use to log into another computer over a network to execute commands in a remote machine and to move files from one machine to another. It provides strong authentication and secure communications. SSH provides access to the firewall using an SSH channel. Access via SSH is encrypted.

**Prerequisites**

- For access via SSH, you need an SSH Client, which most Linux systems already include. For MS Windows, the program **PuTTY** is recommended as an SSH client.
- To log into the RouteFinder with Secure Shell (SSH, Port 22), use the **login user** account and the appropriate password that was set up during installation. Remember to change your password regularly!
- Networks allowed to access the RouteFinder using SSH are added on this screen; other networks can be defined on the **Networks & Services > Networks** screen.

**IMPORTANT:** Do not delete any network in the *Allowed Networks/Hosts* currently in use. This will cause the RouteFinder to shut down and you will have to manually reboot. For manual reboot instructions, see **Administration > Restart > Manual Restart**.

Administration >> SSH		
<b>Status</b>		
Status	<input checked="" type="checkbox"/>	
SSH Port	22	<input type="button" value="Save"/>
<b>Allowed Networks/Hosts</b>		
Available Networks/Hosts	Action	Allowed Networks/Hosts
Any WANInterface DMZInterface	<input type="button" value="Add &gt;&gt;"/>	LAN WAN DMZ
	<input type="button" value="&lt;&lt; Delete"/>	
<b>Allowed Users</b>		
Available Users	Action	Allowed Users
admin	<input type="button" value="Add &gt;&gt;"/>	loginuser
	<input type="button" value="&lt;&lt; Delete"/>	

### Status and SSH Port

Initially, this screen displays with **Status** as the only prompt. Once **Status** is checked and you click **Save**, SSH is enabled and the other options display. The TCP port number for the SSH session is specified in the SSH Port Number field; the default is Port 22.

SSH requires name resolution for the access protocol; otherwise, a time-out occurs with the SSH registration. This time-out takes about one minute. During this time it seems as if the connection is frozen or that it can't be established. After that, the connection returns to normal without any further delay.

### Allowed Networks/Hosts

Networks allowed to access the RouteFinder through SSH can be added and deleted here. The default **Any** in **Allowed Networks** ensures a smooth installation and allows everyone to access SSH service.

**Caution:** While the default setting (**Any**) allows everyone to access the SSH service, we recommend that you restrict access to the SSH service for security reasons. You should delete access from all other networks! When deleting a network, the program checks whether you are still able to access **Administration > Administrative Access** from your active IP address after the deleting procedure. If this is no longer possible, the process is not carried out. This check is carried out for the security of the administrator and will ensure that the administrator cannot become locked out accidentally. After completing the adjustments, it is a good idea to disable SSH access again for security reasons.

**Available Networks/Hosts:** The options in the drop-down box are different when Load Balancing is enabled.

When Load Balancing is enabled, the options are:

- Any
- WANLINK1 Interface
- WANLINK
- WANLINK2 Interface
- WANLINK2

When Load Balancing is disabled, the options are:

- Any
- LAN
- WAN
- DMZ
- WAN Interface
- DMZ Interface

### Allowed Users

Users allowed to access the RouteFinder through SSH can be added and deleted here.

Highlight the Users you want to have access to SSH service and click the **Add** button. Users can be deleted from this list at any time.

## Administration > SNTP Client

SNTP (Simple Network Time Protocol) is an internet protocol used to synchronize the clocks of computers on the network. Clicking the SNTP Client check box enables the firewall to act as a SNTP client.

### SNTP Client

#### SNTP Client

Check the SNTP Client box to activate SNTP Client.

#### SNTP Server Address

Enter the IP address of the SNTP Server for which the firewall will contact to synchronize its clock. Then click the **Save** button.

## Administration > Administrative Access

The networks and hosts that are allowed to have administrative access are selected on this screen. This is a good way to regulate access to the configuration tools.

The screenshot displays the 'Administrative Access' configuration page in the MultiTech Systems RouteFinder web interface. The page is organized into a sidebar menu on the left and a main content area on the right. The sidebar menu includes options such as 'System Setup', 'SSH', 'SNTP Client', 'Administrative Access', 'Change Root Password', 'Site Certificate', 'License Key', 'Intrusion Detection', 'Tools', 'System Scheduler', 'Factory Defaults', 'User Authentication', 'Local Users', 'Radius & SAM', 'Version Information', 'Restart', and 'Shutdown'. The main content area is titled 'Administration >> Administrative Access' and contains several sections:

- Administrative Access:** This section contains two lists: 'Available Networks/Hosts' and 'Allowed Networks/Hosts'. The 'Available Networks/Hosts' list includes 'Any', 'WANInterface', and 'DMZInterface'. The 'Allowed Networks/Hosts' list includes 'LAN', 'WAN', and 'DMZ'. There are 'Add >>' and '<< Delete' buttons between the lists.
- Change Password:** This section contains three input fields: 'Old Password', 'New Password', and 'Confirmation'. A 'Save' button is located to the right of the 'Confirmation' field.
- Time Before Automatic Disconnect:** This section contains a single input field for 'Time Before Automatic Disconnect (seconds)' with the value '3000'. A 'Save' button is located to the right of the input field.
- Administrative Access HTTPS Port:** This section contains a single input field for 'Administrative Access HTTPS Port' with the value '443'. A 'Save' button is located to the right of the input field.
- Administrative Access HTTP Port:** This section contains a single input field for 'HTTP Access' with a checkbox. A 'Save' button is located to the right of the input field.
- Logo and Version on Logon Page:** This section contains a single input field for 'Display Logo and Version on Logon Page' with a checked checkbox. A 'Save' button is located to the right of the input field.
- Administrative Authentication Log:** This section contains two input fields: 'Log Successful Attempts' and 'Log Failed Attempts', both with checkboxes. A 'Save' button is located to the right of the input fields.

### Administrative Access - Available Networks/Hosts and Allowed Networks/Hosts

Select the networks/hosts that will be allowed administrative access. Note that the selection box list will include those networks you enter under **Networks & Services > Networks**.

You can change access by moving network/hosts names from the **Available** list to/from the **Allowed** list. The RouteFinder will display an ERROR message if you try to delete access to a network that would cause you to lock yourself out.

**Any** has been set as the default for ease of installation. **ANY** allows administrative access from everywhere once a valid password is provided.

**Caution:** As soon as you can limit the location from which the RouteFinder is to be administered (e.g., your IP address in the internal network), replace the entry **ANY** with a smaller network. The safest approach is to have only one administrative PC given access to the RouteFinder. You can do this by defining a network with the address of a single computer from the **Networks and Services > Networks** screen.

**Available Networks/Hosts:** The options in the drop-down box are different when Load Balancing is enabled.

**When Load Balancing is enabled, the options are:**

Any, WANLINK1 Interface, WANLINK, WANLINK2 Interface, WANLINK2

**When Load Balancing is disabled, the options are:**

Any, LAN, WAN, DMZ, WAN Interface, DMZ Interface



**Change Password**

You should change the password immediately after initial installation and configuration, and also change it regularly thereafter. To change the password, enter the existing password in the Old Password field, enter the new password into the New Password field, and confirm your new password by re-entering it into the Confirmation entry field.

**Caution:** Use secure passwords! For example, your name spelled backwards is not secure enough; something like **xFT35\$4** is better.

**Time Before Automatic Disconnect**

An automatic inactivity disconnection interval is implemented for security purposes. In the **Time Before Automatic Disconnect** entry field, enter the desired time span (in seconds) after which you will be automatically disconnected from the software program if no operations take place.

After the initial installation, the default setting is 3000 seconds. The smallest possible setting is 60 seconds. If you close the browser in the middle of an open configuration session without closing via Exit, the last session stays active until the end of the time-out and no new administrator can log in. If using SSH, you can manually remove the active session if you log into the RouteFinder as login user via **SSH**. With the command **SU**, you become a root user and can then interrupt the current connection with **rm -f /tmp/wfelogk**.

**Administrative Access HTTPS Port**

This field is used for setting the HTTPS port for Web administration. After setting the HTTPS port, the connection is terminated. The browser settings have to be changed for the new port number before starting the next session.

By default, port 443 is configured for HTTPS sessions. The value of the port number should lie between 1 and 65535. Well known ports and ports already used by the firewall are not allowed. If you want to use the HTTPS service for other purposes (e.g., a diversion with **DNAT**), you must enter a different TCP port for the interface here. Possible values are 1-65535, but remember that certain ports are reserved for other services. We suggest you use ports 440-450. To have Administrative Access after the change, you must append the port to the IP address of the ROUTEFINDER separated by a colon (e.g., <https://192.168.0.1:445>).

**Administrative Access HTTP Port**

Check this box if you want to use HTTP to access the RouteFinder's software. This is less secure, but it is faster when performing administrative tasks. Click **Save**.

**Logo and Version on Logon Page**

Check this box if you want the logo and version number to display on the logon page. Click **Save**.

**Administrative Authentication Log****Log Successful Attempts**

If you check this box, the successful login attempts at the RouteFinder's administrative access interface will be recorded and displayed on the **Statistics & Logs > Administrative Authentication** screen.

**Log Failed Attempts**

If you check this box, the failed login attempts at the RouteFinder's administrative access interface will be recorded and displayed on the **Statistics & Logs > Administrative Authentication** screen.

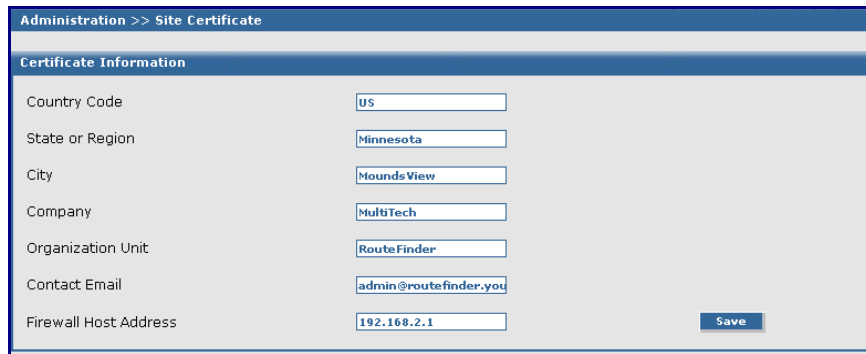
**Administration > Change Root Password**

Use this screen to change the root password of the RouteFinder. Enter the existing password in the Old Password field, enter the new password into the New Password field, and confirm the new password by re-entering it in the Confirmation field. The default password is **root**.

The screenshot shows a web browser window with the title 'Administration >> Change Root Password'. The main content area has a header 'Change Password' in a blue bar. Below this, there are three text input fields labeled 'Old Password', 'New Password', and 'Confirmation'. To the right of the 'Confirmation' field is a blue button labeled 'Save'.

## *Administration > Site Certificate*

Public keys are used as the encryption algorithm for security systems. For the validity of public keys, certificates are issued by a Certificate Authority that certifies the person or the entity is authenticated and that the present public key belongs to that same person or entity. On this screen, enter server certificate information, which the firewall needs to authenticate itself to your browser. After saving the settings, the browser's security information settings have to be cleared.



### *Certificate Information*

#### **Country Code**

Use the default (United States) or change to the country of operation.

#### **State or Region**

Enter the state, province, region, etc. of operation.

#### **City**

Enter the city name.

#### **Company**

Enter the company name.

#### **Organization Unit**

Type the organizational unit (e.g., Sales & Marketing).

#### **Contact Email**

Type the email address of the contact for RouteFinder certificate data (e.g., the RouteFinder administrator) over the default (myname@mydomain.com).

#### **Firewall Host Address**

Enter the RouteFinder's host address. Use the same address that you will use to open the Administration Access interface. It can be one of the RouteFinder IP addresses.

- **Example:** If you access Administration Access with <https://192.168.10.1>, the Host Address must also be **192.168.10.1**. If you access Administration Access with a DNS host name (e.g., <https://MultiAccess Communications Server.mydomain.com>), then use this name instead.
- **Note:** The Host Address field MUST match the host Address or IP Address that you use in your browser to open Administration Access.

#### **Click Save**

The browser will reconnect to the VPN. At the security Alert screen, click **View Certificate**. Then click **Install Certificate** if you have not previously installed it:

#### **Install the Certificate into the Trusted Root Certification Authorities Store**

1. When the first screen displays, click the **Install Certificate** button.
2. On the Welcome to Certificate Import Wizard screen, click the **Next** button.
3. On the Certificate Manager Import Wizard screen, click **Next**. You can elect to have the certificate automatically placed into a directory or you can Browse and choose your own directory. If you elect to place all certificates into a selected location, follow the on-screen prompts for Select Certificate Store, Physical Stores, and Root Stores.
4. When the certificate has been added to the Root Store, the Completing the Certificate Manager Import Wizard displays. Click **Finish**.



## Administration > License Key

The system license key, virus scanner license key, and the URL Categorization engine license key can be configured from this screen.

### Notes:

- Each RouteFinder ships with a unique individual system license key. It is a 20-digit code that is provided on the RouteFinder CD.
- The AntiVirus key can be purchased from Multi-Tech Sales Support.

Administration >> License Key	
License	
System License Key	<input type="button" value="Open"/>
AntiVirus License Key	<input type="button" value="Open"/>
URL Categorization License Key	<input type="button" value="Open"/>

### License

Click the **Open** button for the desired license key. The **Enter License Key** screen displays.

#### System License Key

Enter the license key number assigned to your RouteFinder and click **Save**. When you have entered the License Key accurately, the Enter System License Key screen is re-displayed.

#### Important:

- The license key number is a 20-digit alphanumeric entry; **the letters must all be in upper case**.
- If you enter your license key number incorrectly, the message **Error: License is invalid** is displayed. Check the license key number and re-enter it. One common entry error is mistaking a 0 (zero) for an o (the letter O). Another entry error is entering lower case letters or symbols.
- The License Key number is tied to and tracked with your RouteFinder's serial number.
- Whenever you require additional licenses, you must first provide Multi-Tech with your current License Key and serial number information in order for us to update your RouteFinder.
- With a valid License Key, you are entitled to use Multi-Tech's Update service and support.

#### AntiVirus License Key

The AntiVirus license key can be purchased from Multi-Tech sales support. Enter the license key.

#### URL Categorization Key

A 30-day trial license key is included with your RouteFinder when it ships, but you must enter the license key to activate the feature. The 15-digit key number is included on the serial label located on the front page of the Quick Start Guide and on the bottom of the RouteFinder chassis.

Administration >> License Key	
<b>Registration Information</b>	
Serial Number	<input type="text" value="xxxxxxxxxx"/> <input type="button" value="Save"/>
<b>Activate categorization engine</b>	
Activate categorization engine	<input type="button" value="Activate"/>
Expiry date for categorization engine: 2007-03-16 at 15:51:16.	
<input type="button" value="Back"/>	

## Administration > Intrusion Detection

The Intrusion Detection mechanism notifies the administrator if there has been any tampering with the files on the server.

**Administration >> Intrusion Detection**

**Intrusion Detection for Configuration Files**

Enable File Integrity Check ☐

Time Interval Hourly Save

**Network Intrusion Detection**

Network Intrusion Detection For LAN ☐

Network Intrusion Detection For WAN ☐

Network Intrusion Detection For DMZ ☐ Save

**User Defined Network Intrusion Detection Rules**

Src IP Address	Dest IP Address	Service	
<span>Any</span>	<span>LAN</span>	<span>Any</span>	<span>Add</span>
Source	Destination	Service	Command

### Network Options Available When Load Balancing is Enabled:

**Network Intrusion Detection**

Network Intrusion Detection For LAN ☐

Network Intrusion Detection For WANLINK1 ☐

Network Intrusion Detection For WANLINK2 ☐ Save

### Intrusion Detection

#### Enable File Integrity Check

Check the box to enable File Integrity Checking.

#### Time Interval

Select the amount of time you would like the system to conduct this check. Options are every 5 Minutes, Hourly, or Daily. Then click the **Save** button.

### Network Intrusion Detection

This allows the administrator to detect attacks on the network. When this feature is enabled, it informs the administrator by email as soon as the attack has been logged. The administrator can decide what actions are to be taken. By default, DOS attack, minimum fragmentation checks, port scans, DNS attacks, bad packets, overflows, chat accesses, Web attacks will be detected; and then the administrator is informed. Apart from the above, the other user-defined rules for intrusion detection can be configured.

#### When Load Balancing is disabled, you have the following options:

- **Network Intrusion Detection for LAN:** Check this box to enable Network Intrusion Detection for the LAN. Then click the **Save** button.
- **Network Intrusion Detection for WAN:** Check the box to enable Network Intrusion Detection for the WAN. Then click the **Save** button.
- **Network Intrusion Detection for DMZ:** Check the box to enable Network Intrusion Detection for the DMZ. Then click the **Save** button.

#### When Load Balancing is enabled, you have the following options:

- **Network Intrusion Detection for LAN:** Check this box to enable Network Intrusion Detection for the LAN. Then click the **Save** button.
- **Network Intrusion Detection for WANLINK1:** Check the box to enable Network Intrusion Detection for the WANLINK1. Then click the **Save** button.
- **Network Intrusion Detection for WANLINK2:** Check the box to enable Network Intrusion Detection for the WANLINK2. Then click the **Save** button.

**User-Defined Network Intrusion Detection Rules****Src IP Address**

This selection allows you to choose the network from which the information packet must be sent for the rule to match. Network groups can also be selected. The **ANY** option matches all IP addresses; it does not matter whether they are officially assigned addresses or private addresses. These Networks or groups must be predefined in the *Networks* menu.

**Destination IP Address**

This selection allows you to choose the network to which the information packet must be sent for the rule to match. Network groups can also be selected. These network clients or groups must have been previously defined in the *Networks* menu.

**Service**

This selection allows you to choose the corresponding service. The service must have been previously defined in the *Services* menu.

**Add**

After the rules are defined/selected, click the **Add** button. The commands can be deleted by clicking **Delete** under the *Command* option.

## **Administration > Tools**

There are four tools that can help you test the network connections and RouteFinder functionality. Ping, Trace Route, TCP Connect, and DDNS Force Update test the network connections on the IP level. TCP Connect also tests TCP services for availability.

- For these tools to function, the ICMP on firewall function in **Packet Filter > ICMP** must be enabled.
- For the Name Resolution function, enable the DNS proxy function in **Proxy > DNS**. To use the Name Resolution function, enable a name server in the menu (item) Proxy > Name Server. When the Name Server is enabled, the IP addresses of the reply packets will be converted into valid names.

The screenshot shows the 'Administration >> Tools' window. It contains four tool sections, each with input fields and a 'Start' button:

- Ping:** Fields for Host, No. of Pings (set to 3), Timeout (seconds), and Packet Size (bytes). A 'Start' button is on the right.
- Trace Route:** Field for Host. A 'Start' button is on the right. Below the field, a red note states: 'Ports 33000 to 34000 will be opened temporarily during traceroute.'
- TCP Connect:** Fields for Host and Port. A 'Start' button is on the right.
- DDNS Force Update:** Field for Force Update. An 'update' button is on the right.

### **PING**

Ping is an acronym for Packet Internet Groper. The PING utility is used as a diagnostic tool to determine if a communication path exists between two devices on the network. The utility sends a packet to the specified address and then waits for a reply. PING is used primarily to troubleshoot Internet connections, but it can be used to test the connection between any devices using the TCP/IP protocol.

If you PING an IP address, the PING utility will send four packets and stop.

If you add a -t to the end of the command, the PING utility will send packets continuously.

#### **Host**

Specify the IP address or name of the other computer for which connectivity is to be checked.

#### **Number of PINGS**

Select the number of pings. You can choose 3 (the default), 10 or 100 pings. Enter the IP address or the name into the Host entry field (e.g., port 25 for SMTP).

#### **Timeout**

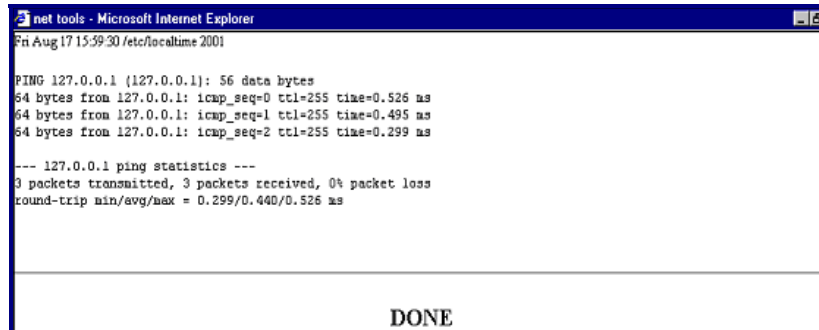
Specify the time that packets can exist.

#### **Packet Size**

Specify the number of data bytes to be sent.

**PING continued****Start**

After clicking the Start button, a new browser window opens with the PING statistics accumulating. "Close the PING Statistics Window to A Sample" PING log is shown below.

**Trace Route**

Trace Route is a tool for finding errors in the network routing. It lists each router's addresses on the way to remote systems. If the path for the data packets is temporarily unavailable, the interruption is indicated by asterisks (\*). After a number of tries, the attempt is aborted. The interrupted connection can have many causes, including the packet filter on the RouteFinder not allowing the operation of Trace Route.

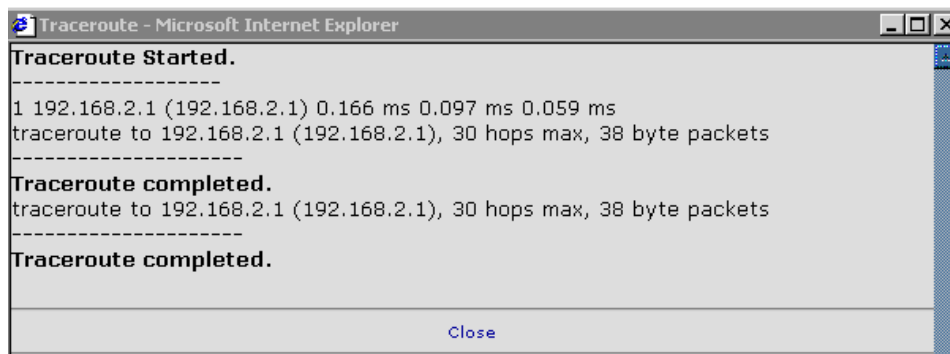
Trace Route lists the path of the data packets all the way to the desired IP address. The path ends when the destination address has been reached. Should the data packets' path momentarily not be traceable, stars (\*) appear to indicate a time-out. After a fixed number of time-outs, the attempt is aborted. This can have various reasons (e.g., a packet filter doesn't allow Trace Route). If it is not possible to locate a name despite activated name resolution, the IP address is shown after several attempts instead.

**Host**

Specify the **IP address** or the name of the other computer to test this tool.

**Start**

Click the corresponding **Start** button to start the test.



**A Sample Trace Route Log**

**TCP Connect**

This tool tests the TCP services for availability. At the IP level, only the source and target addresses are used. TCP, however, additionally requires the use of port numbers. A connection on the TCP level is identified by the source address and port as well as the target address and port.

**Host**

Enter the IP address or the name of the Host if the remote computer to which TCP connectivity is tested.

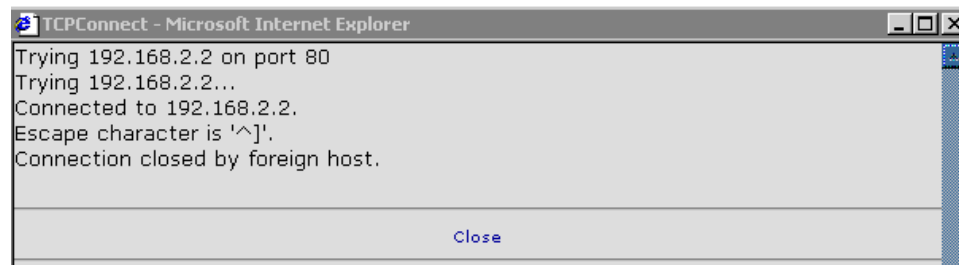
**Port**

Enter the port number into the TCP port entry field. Example: Port number 80 for the HTTP service. The test commences when clicking the **Start** button.

### ***TCP Connect continued***

#### ***Start***

Start the test connection by clicking the **Start** button.



***A Sample TCP Connect Log***

### ***DDNS Force Update***

To update the IP Address of the domain names in the DDNS server for WANInterfaces, click the **Update** button.

**Important Note:** Forcing the DDNS to update more than 5 times without a change in the IP address will result in the IP address being blocked at the DDNS server.

## ***Administration > System Scheduler***

The System Scheduler is a module built into the RouteFinder that **schedules** the tracking or checking the events listed on the screen.

Administration >> System Scheduler		
SMTP Proxy Scheduler for Controlling High Disk Usage		
Event Name	Scheduled Period	Options
Keep Track on Bounce Mails of SMTP Proxy	elevenmins	<a href="#">Change Schedule Period</a>
Keep Track on Bounce Mails of RouteFinder	hourly	<a href="#">Change Schedule Period</a>
Keep Track on SMTP Report Logs	hourly	<a href="#">Change Schedule Period</a>
Check Disk Usage of the Quarantine Mails	elevenmins	<a href="#">Change Schedule Period</a>

### ***SMTP Proxy Scheduler for Controlling High Disk Usage***

This defines the schedule period for an event to happen. It shows the Event Name, the Scheduled Period, and an option to change the schedule period.

1. Click **Change Schedule Period** for the **Event Name** that you would like to change. Once clicked, the **Event Name** and a drop down list box displays.
2. From the drop down list box, select a new amount of time.
3. Each Event offers the following time choices:
  - minutely (every minute)
  - twomins (every two minutes)
  - threemins (every three minutes)
  - fivemins (every five minutes)
  - sevenmins (every seven minutes)
  - elevenmins (every eleven minutes)
  - thirtymins (every thirty minutes)
  - hourly (every hour)
  - daily – 1 (once a day)
  - daily – 2 (twice a day)
  - daily – 3 (three times a day)
  - midnight (each day at midnight)
  - weekly (once a week)
  - fortnightly (once every two weeks)
  - monthly (once a month)
4. Click the **Change** button. The new time selection is scheduled and displays in **Scheduled Period**.

## ***Administration > Factory Defaults***

Click the **Factory Defaults** button on this screen to return all RouteFinder settings to the original factory defaults. This will change **all** the settings you have modified. You may want to record current settings for referencing later on.

You have the option to Clear All Logs before resetting the factory defaults.

Administration >> Factory Defaults	
Reset to Factory Defaults	
Clear All Logs	<input type="checkbox"/>
Factory Defaults	<b>Factory Defaults</b>

## Administration > User Authentication > Local Users

In this part of the software enter local users and define their access to various proxies.

External user databases can also be accessed (e.g., RADIUS servers, Windows NT servers, or Windows 2000 servers). User Authentication is useful if a user database already exists on such a server, in which case the user need not be created on the RouteFinder again.

At the IP level, you can limit the access to the proxy services of your RouteFinder by setting **Packet Filter rules** on your internal clients. This poses certain problems, however, if you are using a dynamic configuration protocol internally, such as DHCP or BOOTP. In this case, user authentication becomes irrelevant. When requests are made to a proxy service, the client must authenticate himself with his user name and password. This makes the authentication person-based (i.e., user-based) and not IP-based, thus making a person-based Accounting in the HTTP proxy access protocol possible.

### Prerequisite

Before you can use Local Authentication, you must activate **User Authentication** for the respective proxy services. In **Proxy** (e.g., **Proxy > HTTP** or **Proxy > SOCKS**) check the **Local** in the Authentication Types menu; then click **Add**.

Username	Allowed features	Options
admin	---	<a href="#">Edit</a> Static
loginuser	-- ssh	<a href="#">Edit</a> Static

### User Definition

- User Name** Enter the name of the user. This is a required field.
- Password** Enter the user's password. The password should be a minimum of 8 characters.
- Confirmation** Confirm the password entered above by entering it again.
- Description** Enter a short comment that will identify the user to you.
- HTTP User** Check this checkbox if you want the user to have access to the HTTP proxy.
- SOCKS User** Check this checkbox if you want the user to have access to the SOCKS proxy.
- SSH User** Check this checkbox if you want the user to have SSH access.
- Add Button** Click **Add** after all the parameters are entered. After a successful definition, the new user displays in the user table.
- Edit or Delete** You can edit or delete entries in the table by highlighting the desired entries and clicking **Edit** or **Delete** under **Command**.



## Administration > User Authentication > RADIUS & SAM

**RADIUS (Remote Authentication Dial-In User Service)** is a protocol with which equipment such as an ISDN router can access information from a central server for user authentication. It also manages technical information needed for the communication of the router with the equipment of the caller. This includes, for example, the protocols used, IP addresses, telephone numbers, timeouts, routes, etc. Together they create a user profile that is stored in a file or a database on the RADIUS server. RADIUS is also used as a generic authentication protocol.

The RADIUS protocol is very flexible and is available for most operating systems, including Microsoft Windows NT/2000. RouteFinder RADIUS implementation lets you configure access rights on the basis of proxies and users.

A RADIUS server should not be visible to the world at large, but should be contained behind the firewall. If the RADIUS server is visible from the Internet, a number of attacks become possible.

**Note:** In order to use any of these authentication methods, you must activate user authentication and the type of authentication for the services. Mark the option (Local, SAM, RADIUS) in the select menu of the respective services. SSH by default authenticates users using the local system, and you cannot disable local authentication for SSH; whereas, for SOCKS and HTTP, any type of authentication can be enabled or disabled.

### RADIUS Prerequisite

Before you can activate **RADIUS** authentication, you need a RADIUS server on your network. The server could also be somewhere in the external network (Internet). But, since the passwords are transferred in plain text, we strongly recommend that the RADIUS server be located close to the RouteFinder and that they are connected via a switching hub. In case of transfer via a public network, we recommend the use of an encrypted tunnel.

### RADIUS Settings

#### RADIUS Server Address

Set the IP address of the RADIUS server.

#### RADIUS Server Secret

Enter the password for the RADIUS server.

#### Save

After entering the above parameters, click the **Save** button.

#### A Note About Microsoft IAS

For information about Microsoft's IAS (RADIUS server for MS Windows NT and 2000), see Multi-Tech's RASExpress RADIUS Setup Reference Guide. The guide also gives you step-by-step setup examples and links to Microsoft's ISA site.

**SAM Prerequisite**

In order to be able to use this authentication method, your network requires a Microsoft Windows NT or 2000 computer that contains the user information. This can be a **Primary Domain Controller (PDC)** or an independent server.

This server has a NETBIOS name (the NT/2000 server name) and an IP address.

**Under the Administration menu, open User Authentication > RADIUS & SAM.**

- Domain** Enter the name of your MS Windows NT/2000 domain into this field.  
Accepted characters are: the alphabet, the numbers 0 to 9, the minus sign, and underscore.  
**Caution:** This is not an Internet domain (e.g., *Company.com*) but a simple denominator (e.g., Intranet). If, instead of using the Microsoft domain concept, you only have a simple server, then enter the NetBIOS name. This corresponds to the entry in the PDC name entry field.
- PDC Name** Enter the NETBIOS name of the primary domain controller into this field. As of Microsoft Windows 2000, these names are also official DNS names. The RouteFinder only supports names consisting of alphanumeric and minus and full-stop characters. Special characters such as % ! # \_ { } are not permitted.
- PDC IP** Enter the IP address of the primary domain controller into this field.
- BDC Name** If you are using a backup domain controller, enter the name into this field. If you do not have a backup domain controller, enter the PDC name again.
- BDC IP** Enter the IP address of the backup domain controller into this field. If you do not have a backup domain controller, enter the PDC IP address again.  
Confirm your entries by clicking the **Save** button.  
**Important Note:** If you are using SAM authentication, you should deactivate the guest account of your Windows domain. Otherwise all user/password combinations are counted as valid.

**SAM**

This authentication method uses an MS Windows NT/2000 domain controller or a standalone server to evaluate the requests. Many businesses are already using MS Windows NT/2000 networks that are based on the MS Windows NT/2000 active directory domain concept.

The advantage of SAM is that it is very easy to configure if there is already a PDC (Primary Domain Controller) or a simple server with a user database running in the network.

The disadvantage is that this model cannot discern between different user groups and proxies. This means that you can grant only **all** users or **none** of the users access to a particular proxy.

**SAM Settings****Domain**

Enter the domain name of the PDC/DC Domain.

**Primary Domain Controller Name**

Enter the NETBIOS name of the Domain Controller.

**Primary Domain Controller Address**

Enter the address of the Domain Controller.

**Backup Domain Controller Name**

Enter the NETBIOS name of the Backup Domain Controller (if present). If you are not using a backup domain controller, then you can enter Primary Domain Controller name in this field.

**Backup Domain Controller Address**

Enter the address of the Backup Domain Controller.

**Save**

After entering the above parameters, click the **Save** button.

## **Administration > Version Information**

This screen displays the number of the RouteFinder's current software and patches applied (if any).

## **Administration > Restart**

1. Click the **Restart** button to shut down and restart the RouteFinder.  
The message **Are you sure you want to restart the system?** is displayed.
2. Click the **OK** button to confirm that you want to restart the RouteFinder WebAdmin software. The complete restart can take 4 to 5 minutes. When the restart process is complete, the RouteFinder will generate 5 consecutive beeps; you can now continue RouteFinder operation.  
If you do not want to restart the RouteFinder software, click **Cancel**.

### **Manual Restart**

There may be instances in which your RouteFinder may need to be restarted manually. In this situation, follow these steps:

- Connect a keyboard and monitor to the RouteFinder and issue these commands:
  - \* login as *root*
  - \* use password: *admin* (the default password)
- Then type the following:
  - \* `/etc/multicong/scripts/bkupmain importbkp default`
- Press Enter.

## **Administration > Shutdown**

Click the **Shutdown** button to shut down the RouteFinder. This is the correct way to shut down the RouteFinder. It ensures that all the services are shut down correctly.

### **Are you sure you want to shutdown the system? message displays.**

- If you do not want to shut down the RouteFinder, click the **Cancel** button to return to the **Administration > Shutdown** menu.
- If you want to shut down the RouteFinder, click the **OK** button to confirm.

The Login screen displays while the shut down process takes place (2 to 5 minutes). A continuous beep occurs when shutdown is complete. At this point you can power off the RouteFinder.

**Caution:** You should switch off the RouteFinder power only after you have performed this **Shutdown** process. If the RouteFinder is not properly shut down before switching off Power, the next start may take a little longer. In the worst case, data could be lost. Since the RouteFinder is now also checking the consistency of the file system, it may have to restart up to three times.

## Networks & Services


### *Networks & Services > Networks*

A network always consists of a Name, an IP address, and a Subnet Mask address. Once you add a network, the information displays at the bottom of the screen.

#### Important Notes:

- The first four networks on this screen are default entries and cannot be changed.
- LAN and WAN interfaces will change if changes are made to LAN/WAN IP addresses in Network Setup.
- To define a single host, enter its IP address and use a netmask of 255.255.255.255. Technically, single hosts are treated in the same way as networks.
- You can also use the bit "spelling" for the Subnet mask (e.g., write 30 instead of 255.255.255.252).
- A network or host can be deleted only if it is not used for any route or by any other module.
- If a network is being used by a routing section, that network cannot be edited. Similarly, if a host address is edited and changed to a network address, and if that host was used by SNAT or DNAT, the changed will not be performed.

#### *Networks/Hosts Listed When Load Balancing Is Disabled*

			
Administration   <b>Networks &amp; Services</b>   Proxy   Network Setup   DHCP Server   Tracking   Packet Filters   VPN   Statistics & Logs			
Home   Wizard Setup   Help   Logout			
<b>Networks &amp; Services</b>			
<b>Networks &amp; Services &gt;&gt; Network</b>			
Add New Network/Host <input type="button" value="Add"/>			
Name	IP Address	Subnet Mask	Options
Any	0.0.0.0	0.0.0.0	Static
LAN	192.168.2.0	255.255.255.0	Static
WANInterface	192.168.100.1	255.255.255.255	Static
WAN	192.168.100.0	255.255.255.0	Static
DMZInterface	192.168.3.1	255.255.255.255	Static
DMZ	192.168.3.0	255.255.255.0	Static

#### *Networks/Hosts Listed When Load Balancing Is Enabled*

<b>Networks &amp; Services &gt;&gt; Network</b>			
Add New Network/Host <input type="button" value="Add"/>			
Name	IP Address	Subnet Mask	Options
Any	0.0.0.0	0.0.0.0	Static
LAN	192.168.2.0	255.255.255.0	Static
WANLINK1Interface	192.168.100.1	255.255.255.255	Static
WANLINK1	192.168.100.0	255.255.255.0	Static
WANLINK2Interface	192.168.3.1	255.255.255.255	Static
WANLINK2	192.168.3.0	255.255.255.0	Static

#### Add Network

##### **Name**

Enter a name into the Name entry field. This name is later used to set packet filter rules, etc. Accepted characters: alphabetic, numerical 0 to 9, the minus sign, underscore. Maximum characters are 39.

##### **IP Address**

Enter the IP address of the network.

##### **Subnet Mask**

Enter the Net Mask.

#### How to Confirm Your Entries

Confirm your entries by clicking the **Add** button. After clicking the **Add** button, the Networks you have setup display on the lower part of the screen. Example:

Name	IP Address	Subnet Mask	Options
RemoteLAN	192.168.100	255.255.255.0	Edit   Delete
RemoteWAN_IP	204.26.122.3	255.255.255.255	Edit   Delete

After a successful definition, the new network is entered into the network table. This network will now be referenced in other menus under this name. You can edit and delete networks by clicking Edit or Delete in the Options column for the network you want to change. The Edit Network Publications (in this example) is displayed. The name of the network cannot be changed, but the IP Address and Subnet Mask can be edited. You can delete a newly created network by clicking on **Delete** in the Options column for a desired network.

**Example 1:** IP address 192.168.2.1 Subnet mask 255.255.255.0 Define a private Class-C net.

**Example 2:** IP address 216.200.241.66 Subnet mask 255.255.255.255 Define a host in the Internet.

**Note About Entries:** Entries can be made in the dot notation style (e.g. 255.255.255.0 for a class C network). **Networks & Services > Networks**

### **Entries on the Network & Services > Networks Screen Display on Other Screens**

<b>Networks added on this screen will display on the following screens:</b>
Administration Access Network Groups SSH Packet Filter Rules Network Intrusion Detection Routing Masquerading SNAT DNAT HTTP Proxy SMTP Proxy DNS Proxy IPSec PPTP
<b>Network Names added on this screen will be made available to:</b>
<i>Add Allowed Networks</i> on Administration Access screen <i>Add packet filter rules</i> <i>Add source</i> for Destination Networks on the Network Intrusion Detection screen <i>Add Routes</i> on the Routing screen SNAT Masquerading Port scan detection and DNAT sections <i>Add allowed networks</i> on SSH, HTTP Proxy, and DNS Proxy screens <i>Add relay networks</i> on SMTP Proxy screen <i>Add subnets</i> on IPSec screen <i>Add local and remote IP addresses</i> on PPTP screen <i>Mac address filtering (destination IP address)</i> on the Packet Filters > Advanced screen <i>Remote Gateway IP</i> and <i>Remote LAN</i> dropdown boxes on the VPN > IPSec > IKE screen

## *Networks & Services > Services*

On this screen you can set the RouteFinder protocol services. Protocols make ongoing administration easier and enable the configuration of user-defined services. These services are used in many of the other configuration settings on the system. A service protocol setting consists of **Name**, **Protocol**, **S-Port/Client** (source port), and **D-Port/Server** (destination port).

Networks & Services >> Services

Add Services

Name	Protocol	S-Port/Client	D-Port/Server	
<input type="text"/>	TCP ▼	<input type="text"/>	<input type="text"/>	Add

Name	Protocol	S-Port	D-Port	Options
Any	any	1:65535	1:65535	Static
AH	ah	0	0	Static
DNS	tcp/udp	1:65535	53	Static
ESP	esp	0	0	Static
FTP	tcp	1024:65535	20:21	Static
FTP-CONTROL	tcp	1024:65535	21	Static
GRE	gre	0	0	Static
H323	tcp	1024:65535	1720	Static
VOIP	udp	5001:65535	5001:65535	Static
HTTP	tcp	1024:65535	80	Static
HTTPS	tcp	1024:65535	443	Static
IDENT	tcp	1024:65535	113	Static
IMAP	tcp	1024:65535	143	Static
netbios-dgm	tcp/udp	138	138	Static
netbios-ns	tcp/udp	137	137	Static
netbios-ssn	tcp/udp	1024:65535	139	Static
NEWS	tcp	1024:65535	119	Static
POP3	tcp	1024:65535	110	Static
PPTP	tcp	1024:65535	1723	Static
SMTP	tcp	1024:65535	25	Static
SNMP	udp	1024:65535	161	Static
SNTP	tcp	1024:65535	123	Static
SOCKS	tcp	1024:65535	1080	Static
SQUID	tcp	1024:65535	3128	Static
SSH	tcp	1:65535	22	Static
TELNET	tcp	1024:65535	23	Static
TRACEROUTE	udp	1024:65535	33000:34000	Static

Name	Protocol	ICMP Type	ICMP Code	Options
Name	Protocol	SPI		Options

### Add Services

#### Name

Enter a unique name in Name entry field. You will need this later (e.g., to set packet filter rules). The name should not be present in the service or service group list. Using a space in the name is not allowed. After you have entered the name, click the **Add** button.

#### Protocol

Select from the following protocols: **TCP**, **UDP**, **TCP & UDP**, **ICMP**, **AH**, and **ESP**. When you select a protocol, the corresponding protocol fields will display.

#### Source Port

Enter the source port for the service. The entry options are a single port (e.g. 80), a list of port numbers separated by commas (e.g. 25, 80, 110), or a port range (e.g. 1024:64000) separated by a colon (:). It will be displayed if the type of the protocol is TCP, UDP, or TCP+UDP.

#### Destination Port

Enter the destination port for the protocol. It is displayed if the type of protocol is TCP, UDP, or TCP+UDP.

#### ICMP Code

Specifies the ICMP type. It is displayed if the type of protocol is ICMP and the ICMP Type is *Redirect Network*, *Network Unreachable*, or *Time to Live Exceeded*.

### **Editing and Deleting User-Added Services**

There are options for editing or deleting the user added services. However, there are some standard services which cannot be edited or deleted. If the service is used by the Packet Filter rules, SNAT, or DNAT, it cannot be deleted.

For editing any user-defined service, the **Edit** button has to be clicked to get the fields corresponding to the service entry.

#### **Edit**

By clicking **Edit** in the Options column, the information is loaded into the entry menu of the **Edit Service** screen. You can then edit the entry. You can edit user-added services only. The entries can be saved using the **Save** button.

#### **Delete**

By clicking **Delete** in the Options column, the service is deleted from the Services table. Changes can be saved using the **Save** button.

### **Notes About Protocols**

1. **TCP & UDP** allow both protocols to be active at the same time.
2. The **ICMP** protocol is necessary to test network connections and RouteFinder functionality, as well as for diagnostic purposes. In the **Packet Filter > ICMP** menu you can enable **ICMP Forwarding** between networks, as well as RouteFinder ICMP reception (e.g., to allow **ping** support).
3. The **ESP** protocol is required for Virtual Private Network (VPN).
4. The **AH** protocol is required for Virtual Private Network (VPN).
5. For **AH** and **ESP**, the **SPI** is a whole number between 256 and 65536, which has been mutually agreed upon by the communication partners. Values below 256 are reserved by the Internet Assigned Numbers Authority (IANA).

### **Entries on This Screen Display on Other Screens**

<b>Service Names added on this screen will display on the following screens</b>	
<i>Screen Fields</i>	
Packet Filter Rules	<i>Add packet filter rules</i>
Packet Filters > Advanced	<i>MAC Address Based Filtering</i>
Network Intrusion Detection	<i>Add specific services for Network Intrusion Detection</i>
SNAT	<i>Add rule</i>
DNAT	<i>Add rule</i>



## Networks & Services > Network Groups

On this screen you can combine various networks into groups. The networks added in the screen **Network & Services > Networks** can be placed into groups.

### Rules and Suggestions for Establishing a Network Group

- A network that is already a part of a group cannot be added to any other group.
- It is suggested that you start a group name with a **G-** or **Group-**. This will identify group network names in contrast to network names.
- When editing Network Groups, note that by pressing the **Shift** key, several entries can be selected together allowing them to be added or deleted together.
- Every change in **Network Groups** is effective immediately.

### About the Screen

Initially, the screen opens with only the *Add Network Group* field showing. Once a name is entered, the *Select Group* section displays. When the **View/Edit** button is clicked, the *Edit Support* section of the screen displays.

### Add Network Group

Enter a unique name for the **Network Group**. This name is used later if you want to perform operations such as setting packet filter rules. Click the **Add** button.

**Example:** support

### Select Group

New group names entered in the first part of this screen will now display here. Select the group from the drop-down list box you would like to Edit or Delete.

#### View/Edit Group

Click the **View/Edit Group** button. This allows you to view and edit the networks which are not part of any group and the list of networks which fall under that group. These networks are available to be part of your newly named network group. The **Edit support** (support is the name of a group created for this example) section of the screen displays.

#### Delete Group

Click the **Delete** button to delete the group selected.

### Edit "support"

#### Networks / Hosts to Add

Use the **Networks to Add** button to add networks into the newly named group.

#### Deleting Networks from a Group

Networks can be deleted from the newly created group by clicking the **Delete Network** button.



## ***Networks & Services > Service Groups***

On this screen you can combine multiple Services (see Services section) into groups, called Service Groups. **Service Groups** are treated like single services.

### ***Rules and Suggestions for Establishing Service Groups***

- A service that is already a part of a group cannot be added to any other group.
- A service can also be deleted from a group.
- Every change made to **Service Groups** is effective immediately.

The screenshot shows the 'Networks & Services >> Service Groups' interface. It features three main sections: 'Add Service Group' with a text input and an 'Add' button; 'Select Group' with a dropdown menu (currently showing 'default\_outbound') and 'View/Edit' and 'Delete' buttons; and 'Edit default\_outbound' which contains three columns: 'Services to Add' (a list box with 'Any', 'AH', 'ESP', 'FTP-CONTROL', 'GRE', 'H323'), an 'Action' column (with 'Add >>' and '<< Delete' buttons), and 'Services in the Group' (a list box with 'FTP', 'TELNET', 'SMTP', 'DNS', 'HTTP', 'POP3').

### ***About the Screen***

Initially, the screen opens with only the *Add Service Group* field showing. Once a name is entered, the *Select Group* section displays. When the **View/Edit** button is clicked, the *Edit xxxx* section of the screen displays.

### ***Add Service Group***

Enter a unique name for the **Service Group**. This name is required for later operations such as creating a higher-level service group or to set packet filter rules. Click **Add**.

All names will be added to **Select Group** drop-down list box from which you can **Edit** or **Delete** a Service Group.

### ***Select Group***

New service groups entered in the first part of this screen will now display here. Select the group from the drop-down list box you would like to Edit or Delete.

#### ***View/Edit Group***

Click the **View/Edit Group** button. This allows you to view and edit the services for that group. The **Edit Support** section of the screen displays.

#### ***Delete Group***

Click the **Delete** button to delete the group selected.

### ***Edit Default\_Outbound (Networks to Add and Networks in the Group)***

#### ***Services to Add***

Use the **Services to Add** button to add services into the newly named group. Available services are listed in the drop down list box. They can be viewed on the **Networks & Services > Services** screen.

#### ***Deleting Services from a Group***

Services can be deleted from the newly created group by clicking the **Delete Service** button.

## Proxy

While the packet filter filters the data traffic on a network level, the use of a **Proxy** (also called an Application Gateway) increases the security of the RouteFinder on the application level, as there is no direct connection between client and server.

Every proxy can offer further security for its application protocols. Since each proxy is intended to serve only one or a few application protocols, it usually offers more sophisticated features for logging and real-time analysis of transferred content.

## General Information About Proxies

### Proxy Services and Authentication Methods

The SOCKSv5 and HTTP proxy services support user authentication. Both proxies can be configured so that they either accept all clients (based on IP addresses), or only those clients with a valid user name and password. If you activate user authentication, you must determine which method your RouteFinder will use to evaluate the requested credentials, otherwise the proxy service cannot be used.

The RouteFinder supports user authentication against:

- RADIUS server
- Windows NT SAM user base
- Defined user database in Administration Access

The three user databases can also be interrogated one after the other.

### To Switch Off Proxy Using Netscape Navigator

1. Open the menu **Edit/Settings/Extended/Proxies**.
2. At Manual Proxies Configuration, click the **View** button.
3. At **No Proxy For**, enter the IP address of your RouteFinder.
4. Click the **OK** button to save the entries.

### To Switch Off Proxy Using Microsoft Internet Explorer

1. Open the menu **Extras/Internet** options.
2. Choose the register card **Connections**.
3. Open the menu **LAN Settings/Extended**.
4. Under **Exceptions**, enter the IP address of your RouteFinder.
5. Click the **OK** button to save your settings.

### Rules and Suggestions for Using HTTP Proxy

- A valid name server is required for using an HTTP proxy.
- **Administration Access** should not be called up via one of its own proxies. You should configure your Web browser in such a way that the IP address of the RouteFinder is not reached via a proxy.
- The HTTP proxy is an application gateway that converts the HTTP protocol (TCP/IP-port 80) for the transmission of Web pages. To use an active HTTP proxy, you need matching browser settings (TCP/IP address of your RouteFinder and port 3128). Requests to HTTPS (TCP/IP port 443) are forwarded unchanged.
- Parts of a Web page such as streaming audio and video are not loaded via port 80 (HTTP), but via a different TCP port. These must be dealt with via an appropriate rule in the Packet Filter Rules.

### Using Transparent Mode with HTTP Proxy

- While using transparent mode, all networks that should be forwarded transparently to the Proxy must be assigned. All unassigned networks that you want to connect to the Internet without the proxy must be inserted with a corresponding rule in **Packet Filter**. There is no access to the HTTP proxy using predefined settings in the browser in transparent mode.
- If you choose **Non-Transparent mode**, consider the following:
  - You must assign the networks that are to be allowed to use the proxy.
  - No unassigned networks can use the HTTP proxy if the proxy is configured in the browser.
  - You must set up the RouteFinder internal IP and port 3128
  - User Authentication is possible only in non-transparent mode.

## ***Proxy > HTTP Proxy***

The HTTP Proxy is a function built into the RouteFinder to redirect HTTP requests from LAN and DMZ clients to the Internet. The HTTP proxy acts as a caching server for Web clients, supporting FTP, Gopher, and HTTP meta objects. Unlike traditional caching software, HTTP proxy keeps meta data, especially hot objects, cached in RAM; it also caches DNS lookup.

### **To view and analyze the HTTP proxy logs in Statistics & Logs**

HTTP must be enabled on the **Administration > Web Admin** screen and the port number configured for HTTP access must be used.

### **Notes About the HTTP Proxy Screen:**

- When this screen initially displays, only the HTTP Proxy **Status** field, its checkbox and **Save** button can be seen.
- More parts of the HTTP Proxy screen display after clicking **Status** and **Save**. Also, the **URL Categorization** section and the **Authentication** section display.
- After clicking and saving **URL Filter** and **User Authentication**, more parts to these screen display as shown below.
- If you check and Save **Transparency**, *User Authentication* is not available. The *Transparency* option is not shown on this screen since it was not checked and *User Authentication* was selected.

The screenshot displays the MultiTech Systems RouteFinder interface for configuring the HTTP Proxy. The top navigation bar includes links for Administration, Networks & Services, Proxy, Network Setup, DHCP Server, Tracking, Packet Filters, VPN, and Statistics & Logs. The left sidebar lists various proxy and filter options. The main configuration area is titled 'Proxy >> HTTP Proxy' and contains three sections: 'HTTP Proxy', 'URL Categorization', and 'Authentication'. Each section contains a checkbox for a specific feature and a 'Save' button.

Section	Field	Value	Action
HTTP Proxy	Status	<input checked="" type="checkbox"/>	Save
	Transparent	<input type="checkbox"/>	Save
	Networks (allowed / denied)		Edit
	Banner Filter	<input type="checkbox"/>	Save
	Java Script Filter	<input type="checkbox"/>	Save
	Cookie Filter	<input type="checkbox"/>	Save
URL Categorization	URL Filter	<input type="checkbox"/>	Save
Authentication	User Authentication	<input type="checkbox"/>	Save

### ***HTTP Proxy***

#### ***Status***

To enable HTTP, check the **Status** box and click **Save**.

#### ***Transparent***

Check the **Transparent** box and click **Save**. With the HTTP proxy functioning in transparent mode, Web clients are unaware that their requests are being transferred through an HTTP proxy.

#### ***Networks (allowed/denied)***

See the next page for a complete description.

#### ***Banner Filter, Java Script Filter, and Cookie Filter***

To enable one or any combination of these filters, check the box. Click the corresponding **Save** button each time you enable a filter.

**Banner Filter**

If this is enabled, the Web page banners will be filtered out before the page is forwarded to the Web client.

**Java Script Filter**

If this is enabled, then all the Java Script components in the Web pages will be filtered out before the page is forwarded to the Web client.

**Cookie Filter**

When this is enabled, then cookies in the Web pages will be filtered out before the page is forwarded to the Web client.

**Networks (Allowed or Denied)**

Use these screens to *Allow* or *Deny* a network access to the HTTP Proxy.

Clicking the **Edit** button next to **Networks (Allowed or Denied)** displays the *HTTP Transparent Networks* screen as shown below. **Network Setup > Load Balancing** will display one of two screens to display depending on whether it is enabled or disabled. See the two screens below.

On these screens you can change the status of each network/host to *allowed*, *denied*, *available*. Click the **Change Status** button and select the status you want to assign to the network:

**Allowed:** This allows the network/host to access the HTTP Proxy.

**Denied:** This denies the network/host to access the HTTP Proxy.

**Available:** The network/host is *Available*, but it is neither *Allowed* or *Denied*. No status is defined. This is the default.

**Notes:**

- The *Denied* status takes precedence over the *Allowed* status.
- When the status for **ANY** is defined as *Denied*, all networks/hosts will be denied access to the HTTP Proxy. This take precedence over the status for all networks/hosts.

**HTTP Transparent Networks Listed When Load Balancing Is Disabled**

Proxy >> HTTP Proxy		
HTTP Transparent Networks		
Network/Host	Status	Options
Any	Available	<a href="#">Change Status</a>
LAN	Available	<a href="#">Change Status</a>
WANInterface	Available	<a href="#">Change Status</a>
WAN	Available	<a href="#">Change Status</a>
DMZ	Available	<a href="#">Change Status</a>
DMZInterface	Available	<a href="#">Change Status</a>
RemoteLAN	Available	<a href="#">Change Status</a>
RemoteWAN_IP	Available	<a href="#">Change Status</a>
		<a href="#">Back</a>

**HTTP Transparent Networks Listed When Load Balancing Is Enabled**

HTTP Transparent Networks		
Network/Host	Status	Options
Any	Available	<a href="#">Change Status</a>
LAN	Available	<a href="#">Change Status</a>
WANLINK1Interface	Available	<a href="#">Change Status</a>
WANLINK1	Available	<a href="#">Change Status</a>
WANLINK2Interface	Available	<a href="#">Change Status</a>
WANLINK2	Available	<a href="#">Change Status</a>

### **URL Categorization**

Go to the main *Proxy > HTTP Proxy* screen (see previous page) and check the following boxes:

- Enable *URL Categorization* by checking the **URL Filter** box.
- Click the *URL Categories (allowed/filtered)* **Edit** button.

The **URL Categories** screen displays as shown here.

The screenshot shows the 'URL Categories' screen within the 'Proxy >> HTTP Proxy' section. The screen is divided into two main columns: 'URL Categories allowed' on the left and 'URL Categories filtered' on the right. The 'allowed' list includes: Advertisements, Arts & Entertainment, Chat, Computing & Internet, Criminal Skills, Drugs, Alcohol & Tobacco, Education, Finance & Investment, Food & Drink, and Games. The 'filtered' list includes: Adult/Sexually Explicit and Gambling. Between the lists are two buttons: 'Filter >>' and '<< Allow'. Below these lists is a 'Get URL Category' section with a 'URL' label, a text input field containing 'http://', and a 'Go' button. At the bottom is a 'Submit A Site' section with a link 'To submit sites to be blocked/unblocked, [Click Here](#)'. A 'Back' button is located at the bottom right of the screen.

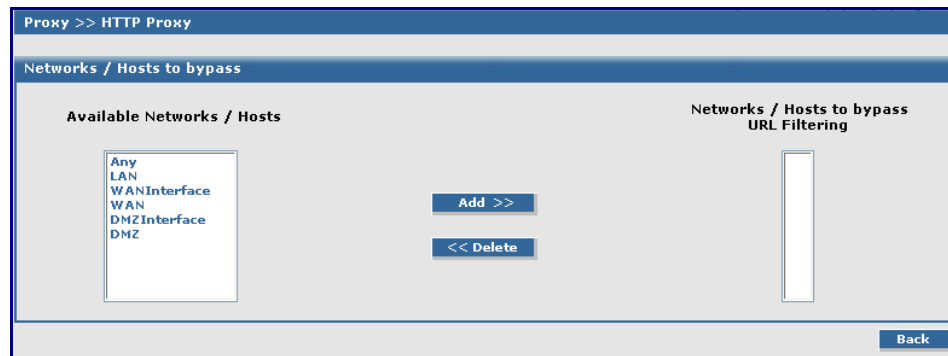
#### **URL Categories (allowed/filtered)**

On this screen you can change URL categories from **Allowed** to **Filtered** and *vice versa*). The **Allow** and **Filter** buttons will move a URL Category from **Allowed** to **Filtered** box and back again. Categories are setup and controlled by a URL filtering software program built into your RouteFinder.

### **Networks / Hosts to Bypass URL Filtering**

Go to the main *Proxy > HTTP Proxy* screen, do the following:

- Click the **Edit** button for **Networks / Hosts to bypass URL Filtering**. The Networks / Hosts to bypass URL Filtering screen displays.



On this screen, use the **Add** button to move a network/host name into the **Bypass URL Filtering** box. To remove a network/host from the bypass filter, select the name and click the **Delete** button. The name moves back into the Available list.

### **User Authentication**

User Authentication is the third section of the *Proxy > HTTP Proxy* screen.

#### **User Authentication**

Enable User Authentication by checking the **User Authentication** box and clicking **Save**

#### **Authentication Types**

- Select the desired Authentication Type:
  - Local
  - RADIUS
  - SAM
- Click the **Save** button.

#### **Available Users**

- Select the User you want to have access to HTTP Proxy server from the **Available Users** list.
- Click the **Add** button. The user now displays in the **Allowed Users** box. You can remove an allowed user by highlighting the name and clicking the **Delete** button. The name goes back to the **Available Users** list.

#### **Adding New Users**

New users can be added to the Available Users list on the Administration > User Authentication screen.

#### **Notes:**

##### **Adding New Users**

New users can be added to the Available Users list on the Administration > User Authentication screen.

##### **Non-Transparent Mode**

When the HTTP proxy functions in non-transparent mode, then the authentication mechanism through which the user can be authentication can be configured.

## ***Proxy > HTTP Proxy > Custom Filters***

The URL Categories in the HTTP Proxy page allows URLs to be filtered or forwarded by the firewall. On this screen, you can configure Custom Filters. Custom filters will take preference over URL categories. You can use custom filters to build groups of filters or lists that can be filtered by networks. The set of rules for the forwarding and filtered of URLs for a particular network can be configured here. Note that this screen shows additional fields; it has been expanded by adding a URL List Name and clicking **Add**.

### ***Default Action for Custom URL Lists***

#### ***Default Action***

Select either **Allow** or **Deny** for your Custom Filter. Click the **Save** button.

### ***Add Custom URL List***

#### ***URL List Name***

Enter a Custom URL Group or List name that will define an access rule. Click the **Add** button to save the name. After clicking the **Add** button, the *Access Rules* section of the screen displays.

### ***Access Rules***

**Access Rules** enable you to define custom rules. Because of these custom rules, networks or network groups can be allowed or denied access to certain URLs. URLs can be added or deleted from this list.

Click the **Edit** button to open a screen for entering URLs into the list. A text box and a list box for the URL will be shown. The list box will contain the list of URLs that are already part of this list. URLs can be added to the list by entering it into the text box and clicking the **Add** button.

URLs can be deleted from the list by selecting it and clicking the **Delete** button. Then click the **Save** button.

After making any changes, click the **Save** button to save these changes.

An access rule consists of three parts:

1. Network or Network Group
2. URL Group or List
3. Set either Allow or Deny

### ***Example***

List Name: URL List named **List1** contains google.com

Networks: There are two networks **Net1** and **Net2**

Rules: Two rules have been configured:

**Net1 – List1 – allow and**

**Net2 – List1 – deny**

Explanation:

- Users from **Net1** trying to access google.com will be allowed to access the site.
- Users from **Net2** trying to access google.com will not be allowed to access the site.
- Users from any other network will be allowed/denied access based on the URL Categorization rules.

## Proxy > SMTP Proxy

On this screen (the full screen displays once the *Status* box is checked), you can configure the SMTP proxy and the Virus Protection function. The SMTP proxy acts as an email relay. It accepts email for your Internet domains and passes them on to your internal email distribution system. This can be accomplished via a Microsoft Exchange Server, for example. Emails are transparently scanned for known viruses and other harmful content. The SMTP proxy also acts as a gateway for outgoing mail, thus taking over the job of email distribution from your internal email system.

### How the SMTP Proxy Works

For **SMTP**, a valid name server (**DNS**) must be enabled. The RouteFinder sends notifications to the administrator even if **SMTP** is disabled. The RouteFinder processes up to 25 incoming SMTP connections simultaneously preventing Denial of Service (DoS) attacks. The 26<sup>th</sup> incoming connection is not accepted.

Proxy >> SMTP Proxy		
<b>SMTP Proxy</b>		
Status	<input checked="" type="checkbox"/>	<input type="button" value="Save"/>
Accepted Incoming Domains	<input type="text"/> <input type="button" value="v"/>	<input type="button" value="Add"/> <input type="button" value="Delete"/>
Mail relay for	Any <input type="button" value="v"/> <input type="button" value="v"/>	<input type="button" value="Add"/> <input type="button" value="Delete"/>
<b>Add SMTP Routes</b>		
Domain	<input type="text"/>	
Host	<input type="text"/> <input type="button" value="v"/>	<input type="button" value="Add"/> <input type="button" value="Delete"/>
<b>Queue Cleanup</b>		
<input type="button" value="Clean"/>		
<b>Mail Size Configuration</b>		
Maximum Mail Size Allowed (KBytes)	5000 <input type="text"/>	<input type="button" value="Save"/>
<b>Bypass SMTP Virus / Spam Filtering</b>		
Minimum Mail Size to Bypass SMTP Virus / Spam Filtering (KBytes)	200 <input type="text"/>	<input type="button" value="Save"/>
<b>Virus Protection</b>		
SMTP Virus Protection	<input type="checkbox"/>	<input type="button" value="Save"/>
<b>Remote SMTP Virus Quarantine</b>		
Remote SMTP Virus Quarantine Status	<input type="checkbox"/>	<input type="button" value="Save"/>
<b>Action Taken on SMTP Virus Mails</b>		
Action Taken At Present	Block	
Change Action on Infected Mails	Block <input type="button" value="v"/>	<input type="button" value="Save"/>



**SMTP Proxy****Status**

To enable SMTP, check the **Status** box and click the **Save** button. When enabled, the SMTP Proxy starts functioning and listens on port 25. When **Status** is checked, the screen expands to display the following fields.

**Accepted Incoming Domains**

All the domains for which the SMTP Proxy can accept emails must be listed here. The domain for which emails are accepted must be registered with the DNS server. Thus, the SMTP Proxy accepts only emails which are addressed to the domains listed here.

Domains will be listed in the drop-down box from which they can be deleted, if desired.

**Mail Relay**

All the networks that can use the SMTP Proxy as a relay agent are configured here. A list of the various networks configured using this software is displayed. You can add networks that can use the SMTP proxy as a relay agent by using the **Add** button. All other networks not included in this list can send emails to only those domains in the Accepted Incoming Domains list. The IP address of the mail server needs to be added in the list of relay networks.

**Add SMTP Routes**

The SMTP Proxy decides on the path or the route to be taken for any **domains** based on the SMTP Routes configuration. Thus, the domain name and the IP address of the MTA (Mail Transfer Agent) to which mails are destined to this domain are to be forwarded are listed here.

**Example:** xyz.com:192.168.1.34. Any email to domain xyz.com is forwarded to 192.168.1.34, which is the IP address of an MTA. If the SMTP route is not mentioned for a domain, then a DNS-lookup decides where this email is to be forwarded or else a default route can be specified so that email to any domain is forwarded to the default gateway. **Example:** 192.168.1.10.

**Domain and Host**

The fully qualified Domain Name and Host of the SMTP Proxy must be entered here.

**Queue Cleanup**

Click the **Clean** button to delete emails held in the relay agent's mail queue. All mails waiting to be delivered will be cleaned up. This option is to be used with extreme care.

**Mail Size Configuration**

Enter the maximum mail size in Kbytes that will be allowed by the SMTP / Spam filtering process.

**Bypass SMTP Virus / Spam Filtering**

Enter the minimum mail size in Kbytes that will be allowed to bypass the SMTP / Spam filtering process.

**Virus Protection**

Check the box to enable **SMTP Virus Protection** (virus scanning) for SMTP traffic that passes through the RouteFinder. Both incoming and outgoing emails are scanned, if they are sent via the SMTP proxy. If a valid virus license scanner license key is not entered, this option will not be displayed.

An anti-virus license must be purchased from Multi-Tech in order to use virus protection, and the license can be uploaded to the RouteFinder from the **Administration > License Keys** screen.

**Remote SMTP Virus Quarantine**

Check the **Remote SMTP Virus Quarantine Status** box to activate the remote quarantining of SMTP virus emails. If activated, then local quarantining no longer exists.

**Action Taken on Virus Emails**

Select the **Change Action on Infected Mails** to be taken on infected emails for SMTP traffic. If the action selected is **Notify**, options to send the information to the administrator / sender / recipient will be displayed. Notification regarding infected mails will be send based on these settings.

If the action is **Block**, the mail will be silently dropped.

In both cases, the infected emails will be stored in the virus quarantine folder of the RouteFinder. The administrator can view the emails, delete them, or forward them to a specified email ID.

Click the **Save** button after a Change Action.

**Example of SMTP Proxy**

An entry **Company.com** covers all further sub-domains; for example, **subsidiary1.Company.com** and **subsidiary2.Company.com**. The RouteFinder must be the **MX (Mail Exchanger)** for **Company.com**. Incoming emails to non-registered domains are rejected (except for senders listed in Mail relay for below). Confirm every registered domain by clicking the **Add** button. The domains are entered into a window from which the entered domains can be deleted again at any time.

**Mail relay for**

Select all the networks from the select menu that are allowed to use the **SMTP** proxy on the RouteFinder. Networks not entered here can only use the **SMTP** proxy to send emails to the above listed domains. Confirm every selected network by clicking the **Add** button.

**Note:** If you assign **Any**, then everybody connected to the Internet can use your SMTP proxy for SPAM purposes.

**SMTP Routes**

Determine the MTA (Mail Transfer Agent) to which each incoming domain is forwarded. The MTA is determined by its IP address. You can also configure the forwarding of email into your internal messaging system here. If you want to use the SMTP proxy as the SMTP relay (also often called "SmartHost") for your internal email server, configure it to use the internal address of your RouteFinder system as a relay. However, for this to work, the IP address of your internal email server must have been entered in the Mail relay for select menu. (Remember to insert the forwarding of the domains to your internal email server.)

All outgoing mail is then forwarded via the **SMTP** proxy of the RouteFinder.

All settings are immediately active and are preserved after leaving the **Proxies > SMTP** menu.

***Proxy > SMTP Proxy > SMTP SPAM Filtering***

On this screen the SPAM filtering parameters can be set so that all incoming and outgoing emails sent to the internal mail server(s) will go through the SPAM filtering process.

Proxy >> SMTP SPAM Filtering		
<b>RBL Check</b>		
Real Time Black List Check (RBL)	<input type="checkbox"/>	<a href="#">Save</a>
<b>SMTP SPAM Filtering</b>		
Authentic Sender List	<input type="text"/>	<a href="#">Add</a>
Authentic Recipient List	<input type="text"/>	<a href="#">Add</a>
Authentic Networks	<input type="text" value="Any"/> <a href="#">v</a> <input type="text"/> <a href="#">v</a>	<a href="#">Add</a> <a href="#">Delete</a>
Block Networks	<input type="text" value="Any"/> <a href="#">v</a> <input type="text"/> <a href="#">v</a>	<a href="#">Add</a> <a href="#">Delete</a>
Sender Black List	<input checked="" type="checkbox"/> <input type="text"/>	<a href="#">Save</a> <a href="#">Add</a>
Recipient Black List	<input checked="" type="checkbox"/> <input type="text"/>	<a href="#">Save</a> <a href="#">Add</a>
Check For NULL Sender	<input checked="" type="checkbox"/>	<a href="#">Save</a>
Reverse DNS Test	<input type="checkbox"/>	<a href="#">Save</a>
Bad Patterns In Sender/Recipient Address	<input type="text"/> <input type="text"/>	<a href="#">Add</a> <a href="#">Delete</a>
Message Filtering	<input checked="" type="checkbox"/>	<a href="#">Save</a>
Filter Attachments (Enter the file extensions)	<input type="text"/>	<a href="#">Add</a>
Filter based on Subject (Enclose Regular Expressions with < >)	<input type="text"/>	<a href="#">Add</a>
Filter based on Message Expressions (Enclose Regular Expressions with < >)	<input type="text"/>	<a href="#">Add</a>
Adaptive Message Filtering	<input type="checkbox"/>	<a href="#">Save</a>
<b>Remote SMTP Spam Quarantine</b>		
Remote SMTP Spam Quarantine Status	<input checked="" type="checkbox"/>	
E-Mail Address of Spam Account	<input type="text"/>	<a href="#">Save</a>

**RBL Check****Real Time Black List (RBL)**

Check this box to block emails from the IP addresses listed in RBL sites. If emails are to be blocked, the IP address or URL of an RBL server must be entered. If you check RBL, then you will be provided with the list *Authentic List*. Here you can configure IP addresses for which the RBL check can be bypassed.

**RBL Server URL**

Enter the IP address of the sites to be blocked. Then click **Save**.

**SMTP SPAM Filtering****Authentic Sender**

Enter any sender's email ID that you wish to bypass the spam filtering process. Click **Add** after each entry.

**Recipient List**

Enter any recipient's email ID that you wish to bypass the spam filtering process. Click **Add** after each entry.

**Authentic Networks**

Enter any sender's network name that you wish to bypass the spam filtering process.

**Example:** *testuser@routefinder.yourdomain.com*

If you want to add email IDs from the domain *routefinder.yourdomain.com*, then add it as:  
*@routefinder.yourdomain.com*

**Blocked Networks**

Enter the name(s) of any network(s) from which email cannot be sent. If any user tries to send an email from a blocked network, the email connection is rejected. Click **Add**. A network can be deleted as desired.

**Sender Black List**

Enter a sender email addresses to be blocked. Then, if the sender's email address matches any entry in the list, the email will not be forwarded. If all emails from a domain are to be blocked, add this @ symbol before the domain name: *testuser@routefinder.yourdomain.com*

If you want to block all email from the domain *routefinder.yourdomain.com*, then add it as  
*@routefinder.yourdomain.com*

If you want to block all email from the domain *routefinder.yourdomain.com*, then add it as  
*@routefinder.yourdomain.com*

**Recipient Black List**

Enter a recipient's email address to be blocked. Then, if the recipient's email address matches any entry in the list, the email will not be forwarded.

If all email from a domain is to be blocked, add this @ symbol before the domain name:  
*testuser@routefinder.yourdomain.com*

If you want to block all email from the domain *routefinder.yourdomain.com*, then add it as  
*@routefinder.yourdomain.com*

**Check for NULL Sender**

If checked, email with an empty sender address sent to more than one recipient will not be relayed.

**Note:** If the email contains only one recipient ID, even if this option is checked, the email will be relayed to the recipient, since it is legitimate to have NULL sender address in error.

**Reverse DNS Test**

If you check this option, the SMTP Proxy will try to resolve the domain name part of a sender's email ID. If it is resolved to an IP address, then the email will be relayed. If the sender's name is in the Authentic List, then the reverse DNS test will not be performed for the domain.

**Bad Patterns in Sender/Recipient Address**

Enter any pattern in an email address that you would like to block. Then both the sender and recipient email addresses will be checked for these patterns. If the patterns match, the email will not be relayed.

**Control Characters:**

1. Exclamation mark (!): Bypass the SPAM check for this entry alone.  
Example: All email from or to the domain *abc.com* will be stopped except for  
[test@abc.com](#): *\*@abc.com* and [!test@abc.com](#)

2. Asterisk (\*): Stop all email from or to this domain.  
Example: All email from or to the domain *abc.com* will be stopped. *\*@abc.com*
  3. Set ([...]): Stop all email from a set such as *@abc[0-9]\*.com*.  
Example: All email from or to the domains that include numbers in the first part of their names such as *0*, *234*, or *789023* will be stopped.  
*0.com 234.com 789023.com*
  4. Question mark (?): Stop all email with a match zero or one occurrence of the preceding character or set of characters.  
Example: All email from or to the domains *abc.com*, *abc0.com*, *abc1.com*, ...*abc9.com*.  
*\*abc[0-9]? .com*
  5. Backslash (\): Literal expression of the following character (the following character is a metacharacter): *@\[0-9]{1-3}\[0-9]{1-3}\[0-9]{1-3}\]*  
The first two characters after the *@\* means take the literal value of the *[* character.  
Example: Email addresses with IP addresses like *username@[1.1.1.1]* will not be allowed.
- Note:** SPAM emails with percent-hack can be eliminated by adding *\*%\** to **Bad Patterns** list.

### Message Filtering

When **Message Filtering** is checked, the screen expands to display the following fields:

#### Filter Attachments

If you check this option, then the email message or body will be searched for the extensions and expressions added here. Emails containing these file extensions in the attachments will be filtered. The email will be quarantined so that the administrator can decide whether to forward or delete the email.

Examples of extensions are **.bmp**, **.exe**, **.gif**. Also, double extensions such as **.tar.gz** cannot be used.

If you want to search for the expression as is in the email, then add it just as it is. If you want to use the entry as a regular expression, then enclose the entry with these brackets: **< >**

The wild card **'\*** cannot be used to filter all attachments.

#### Filter Based on Subject

Enter the mail subject header to be searched for the expressions added here. If there is a match, that email will be considered as spam.

Example: If the subject *Free* is to be searched in the email, added the word *free*.

#### Filter Based on Message Expressions

The email message and body will be searched for the expressions added here. If the expression "as is" is to be searched for in the email, add the words *as is*. If the entry is to be used as a regular expression, the entry should be enclosed in **< >**.

### Adaptive Message Filtering

If this option is enabled, then the mail message or body will be searched for auto-learned expressions by the Adaptive Message Filtering function.

Click the **Help** button for this screen to read more about **Adaptive Message Filtering**.

### Remote SMTP – Spam Quarantine

This screen displays when **Message Filtering** is checked.

#### Remote SMTP Spam Quarantine Status

Check the **Status** box to enable *Remote SMTP – SPAM Quarantining*, which will send all SMTP SPAM emails to the configured email address entered into the **Email Address of Spam Account** field.

Click the **Save** button.

**Note:** If remote quarantine is enabled, then local quarantine no longer exists.

#### Email Address of SPAM Account

Enter the email address of the spam account. All SMTP spam quarantined emails will be forwarded to this account. The address should be RFC compliant. This is a mandatory field if you checked the Remote SMTP Spam Quarantine Status box.

## **Proxy > POP3 Proxy**

In order to use this function, you must have a valid Antivirus Scanner license key installed. To install one, go to the *Administration > License > Virus Scanner* page.

Use this screen to configure POP3 virus filtering-related settings. All outgoing email will go through this POP3 virus filtering process.

**Note About This Screen:** Initially, only the **POP3 Virus Protection** prompt and the **Remote POP3 Virus Quarantine Status** prompts display. The other two prompts display after checking the initial check boxes and clicking the **Save** button.

Proxy >> POP3 Proxy		
<b>Bypass POP3 Virus / Spam Filtering</b>		
Minimum Mail Size to Bypass POP3 Virus / Spam Filtering (KBytes)	<input type="text" value="200"/>	<b>Save</b>
<b>POP3 Virus Protection</b>		
POP3 Virus Protection	<input checked="" type="checkbox"/>	<b>Save</b>
Inform Admin for Virus Mails	<input type="checkbox"/>	
<b>Remote POP3 Virus Quarantine</b>		
Remote POP3 Virus Quarantine Status	<input checked="" type="checkbox"/>	<b>Save</b>
E-Mail Address of Virus Account	<input type="text"/>	

### **Bypass POP3 Virus – Spam Filtering**

#### **Minimum Mail Size to Bypass POP3 Virus / Spam Filtering (KBytes)**

Select the mail size that will bypass filtering.

**Note:** The next two fields display only if you have purchased the Virus Protection package.

### **POP3 Virus Protection**

#### **POP3 Virus Protection**

Check the box to enable POP3 virus scanning of the traffic that goes through the RouteFinder. Click the **Save** button.

#### **Inform Admin for Virus Mails**

Check this box to have information sent to the administrator. The administrator will receive notification regarding infected emails.

#### **Save**

Click the **Save** button to activate this function.

### **Remote POP3 Virus Protection**

#### **Remote POP3 Virus Quarantine Status**

Check the **Status** box to enable POP3 virus scanning of the traffic that goes through the RouteFinder. Click the **Save** button.

#### **Email Address of Virus Account**

Enter the address of the POP3 Virus Email Account. All POP3 virus quarantined emails will be forwarded to this account. Click the **Save** button.

## ***Proxy > POP3 Proxy > POP3 SPAM Filtering***

The administrator can configure POP3 SPAM filtering and related settings on this screen. All outgoing email retrieved from the internal mail server(s) will go through this POP3 virus filtering.

Proxy >> POP3 SPAM Filtering		
<b>POP3 SPAM Protection</b>		
POP3 SPAM Protection	<input checked="" type="checkbox"/>	
Subject of SPAM Mails	<input type="text" value="SPAM"/>	<input type="button" value="Save"/>
<b>POP3 SPAM Filtering</b>		
Sender White List	<input type="text"/>	<input type="button" value="Add"/>
Recipient White List	<input checked="" type="checkbox"/>	<input type="button" value="Save"/>
	<input type="text"/>	<input type="button" value="Add"/>
Authentic Networks	<input type="text" value="Any"/>	<input type="button" value="Add"/>
	<input type="text"/>	<input type="button" value="Delete"/>
Sender Black List	<input checked="" type="checkbox"/>	<input type="button" value="Save"/>
	<input type="text"/>	<input type="button" value="Add"/>
Block Networks	<input type="text" value="Any"/>	<input type="button" value="Add"/>
	<input type="text"/>	<input type="button" value="Delete"/>
Check For NULL Sender	<input checked="" type="checkbox"/>	<input type="button" value="Save"/>
Bad Pattern In Sender Address	<input type="text"/>	<input type="button" value="Add"/>
	<input type="text"/>	<input type="button" value="Delete"/>
Message Filtering	<input checked="" type="checkbox"/>	<input type="button" value="Save"/>
Filter Attachments (Enter the file extension)	<input type="text"/>	<input type="button" value="Add"/>
Filter based on Subject (Enclose Regular Expressions with < >)	<input type="text"/>	<input type="button" value="Add"/>
Filter based on Message Expressions (Enclose Regular Expressions with < >)	<input type="text"/>	<input type="button" value="Add"/>

### ***POP3 SPAM Protection***

#### ***POP3 SPAM Protection***

Check the box to enable POP3 SPAM Protection.

#### ***Subject of SPAM Mails***

Enter a word that you would like to add to the subject line of any email identified by the virus scanner as SPAM. The word *SPAM* is a good choice.

### ***POP3 SPAM Filtering***

#### ***Sender White List***

Enter the sender email IDs that will **not** be checked for SPAM. For example, if all the emails from the specific domain abc.com are not to be checked for SPAM, then the entry should be @abc.com.

Once you enter the ID and click the **Add** button, the ID displays in a list below the entry field. You may enter more than one email ID, and each ID can be deleted.



**Recipient White List**

Enter the recipient email IDs that will **not** be checked for SPAM. For example, if all the emails from the specific domain *cde.com* are not to be checked for SPAM, then the entry should be *@cde.com*.

Once you enter the ID and click the **Add** button, the ID displays in a list below the entry field. You may enter more than one email ID, and each ID can be deleted.

**Authentic Networks**

Select the network from which a user may retrieve unfiltered email. In other words, the email on this network is not checked for SPAM. Select from *Any*, *LAN*, *WANInterface*, *DMZ*.

Once you select a network and click **Add**, the network displays in a box below this entry field. You may select more than one network, and a network can be deleted whenever you want to make a change.

**Sender Black List**

Enter a sender email addresses to be blocked. Then, if the sender's email address matches any entry in the list, the email will not be forwarded. If all emails from a domain are to be blocked, add this @ symbol before the domain name:

*testuser@routefinder.yourdomain.com*

If you want to block all email from the domain *routefinder.yourdomain.com*, then add it as:

*@routefinder.yourdomain.com*

If you want to block all email from the domain *routefinder.yourdomain.com*, then add it as:

*@routefinder.yourdomain.com*

**Blocked Networks**

If the user tries to retrieve email from the network entered in the list, then that connection of retrieving emails is rejected.

**Check for NULL Sender**

If this option is enabled, email with an empty sender address is marked as SPAM.

**Bad Pattern in Sender Address**

The sender email address will be checked to see if matches any of the patterns added the list. If there is a match, then the email will be marked as SPAM.

Control Character: Asterisk (\*) is a general pattern-matching character. For example, if the entry is

*xyz\*@abc.com*, then all email from the domain *abc.com* with user names starting with *xyz* will be marked as SPAM.

**Message Filtering**

If you check Message Filtering, three additional prompts display. File attachments and specified expressions will be filtered.

**Filter Attachments**

Enter the file extensions to be filtered. Email containing these extensions in the attachments will be checked as spam.

Examples might include files with these extensions: *.bmp*, *.exe*, *.gif*. Also, double extensions such as *tar.gz* cannot be used.

The wild card '\*' cannot be used to filter all attachments.

Forced unzip is disabled.

**Filter Based on Subject**

Enter the mail subject header to be searched for the expressions added here. If there is a match, that email will be considered as spam.

Example: If the subject *Free* is to be searched in the email, added the word *free*.

**Filter Based on Message Expressions**

The email message and body will be searched for the expressions added here. If the expression "as is" is to be searched for in the email, add the words *as is*. If the entry is to be used as a regular expression, the entry should be enclosed in *< >*.



## ***Proxy > POP3 Advanced Configuration***

POP3 Advanced Configuration allows you to specify networks to scan for POP3 traffic for Virus and Spam Filtering.

### ***POP3 Advanced Configuration***

#### ***POP3 Virus / Spam Filtering***

Select one of the incoming networks from the first drop down list box. Then select ANY from the second drop down list box. Confirm by clicking the **Add** button.

Entries can be edited or deleted by selecting the entry and then clicking the **Edit** or **Delete** button.

**ANY > ANY** is a default rule. This rule means that every POP3 request/response will be scanned by POP3 Virus/Spam Protection. Before adding any new rule, you must delete the **ANY > ANY** rule.

#### ***Example 1***

If the POP3 request is from WAN to the Mail Server on LAN/DMZ, then add the rule **WAN > ANY**.

#### ***Example 1***

If the POP3 request is from LAN to the Mail Server on WAN/DMZ, then add the rule **LAN > ANY**.

## ***Proxy > SOCKS Proxy***

SOCKS is a universal proxy supported by many client applications. SOCKS5 is an IETF (Internet Engineering Task Force) approved standard, proxy protocol for TCP/IP-based networking applications. The basic purpose of the protocol is to enable hosts on one side of a SOCKS server to gain access to hosts on the other side of a SOCKS Server without requiring direct IP access. When an application client needs to connect to an application server, the client connects to a SOCKS proxy server. The proxy server connects to the application server on behalf of the client and then relays data between client and the application server. For the application server, the proxy server is the client.

### ***Differences Between SOCKS and NAT:***

- SOCKS allows BIND requests (listening on a port on behalf of a client; however, very few clients support this).
- SOCKS5 allows user authentication.
- The SOCKS proxy is used for point-to-point connections.

The RouteFinder's SOCKS implementation supports the SOCKS protocol versions. However, when using SOCKS v4, **User Authentication** is not possible.

**Socks Default Port:** 1080. Almost all clients will default to this port setting, so it normally does not need to be configured.

**Note:** All changes in **Proxy** become effective immediately without additional notice.

## SOCKS Proxy

### Status

To enable SOCKS, check the **Status** box. Click the **Save** button.

### External Interface

The SOCKS Proxy uses an external interface to send outgoing requests. This is the external interface to the Internet. Select the interface that you want to use.

The options are LAN, WAN, and DMZ when Load Balancing is disabled.

The options are LAN, WANLINK1, and WANLINK2 when Load Balancing is enabled.

### Internal Interface

Select one or two interfaces on which SOCKS is to accept connections from clients. These interfaces can be used by clients with port 1080 to access the SOCKS proxy.

The options are LAN, WAN and DMZ when Load Balancing is disabled.

The options are LAN, WANLINK1 and WANLINK2 when Load Balancing is enabled.

### User Authentication

To enable User Authentication, check the User Authentication box. When enabled, SOCKS proxy users must log in with their user names and passwords.

### Authentication Types

Select the method of user authentication. Options are Local, RADIUS, and Sam. If you choose the Local method, you can choose whether or not local users may use the SOCKS proxy.

If you disable User Authentication, then client applications must be configured with empty user name and password fields!

### Allowed Users and Available Users

Enter a straightforward name that will identify a user group in the Allowed Users text box. Click the Add button. The name will display in the Available Users box. Once the name has been accepted, you can delete it at any time.

### Add Users

A list of all users who are allowed to access the SOCKS Proxy can also be configured by selecting the users from the right selection box and clicking the Add button. These users can also be added by checking the checkbox against SOCKS users in the User Authentication > Users section. The left box contains SOCKS users and the right box consists of all the local users who are not allowed to access SOCKS.

### Delete Users

The users who are now allowed to access the SOCKS Proxy can be changed by selecting the users from the left box and clicking the **Delete** button. These users can also be deleted by unchecking the checkbox against SOCKS users in the **User Authentication > Users** section. The left box contains SOCKS users and the right box consists of all the local users who are not allowed to access SOCKS.

## Proxy > DNS Proxy

DNS Proxy is a module used to redirect DNS requests to name servers. This module supports a caching-only name server which will store the DNS entries for a specified item. So, when there is a query next time, the values will be taken from the cache and the response will be sent from the module itself. This will shorten the waiting time significantly, especially if it is a slow connection.

On this screen you can enter the DNS (Domain Name Server) Proxy for your RouteFinder and configure it.

**Note:** If you configure several name servers, the servers are queried in the listed order.

### DNS Proxy

#### Status

To enable the DNS proxy, check the DNS Status box. Click the **Save** button.

#### Interface to Listen To

Select the Interface option from the drop down list box, and then click the **Add** button. Your choice will display in the box under the selection list. If you want to change or delete an interface, highlight the name and click the **Delete** button.

The options are LAN, WAN and DMZ when Load Balancing is disabled.

The options are LAN, WANLINK1 and WANLINK2 when Load Balancing is enabled.

#### Available Networks

This lists all the networks which are defined under *Networks & Services > Networks*. Select the one(s) you want to be change from *Available* to *Allowed* for the DNS proxy. An allowed network/host can access the DNS Proxy. After you added or deleted a network, click the **Add** button.

The options are Any, WAN Interface, WAN, DMZ Interface, and DMZ when Load Balancing is disabled.

The options are Any, LAN, WANLINK1 Interface, WANLINK1, WANLINK2 Interface, and WANLINK2 when Load Balancing is enabled.

#### Allowed Networks

This is a list of all the networks which are allowed to access the DNS proxy. Any other requests are not forwarded to the DNS proxy.

**Note:** You can delete these networks at any time.

## Network Setup

The Network Setup menus consist of Interface, PPP, PPPoE, DHCP Client, Dynamic DNS, Routes, Masquerading, SNAT, and DNAT screens. With the help of DNAT and SNAT, the destination and source address of the IP packets are converted. With **Masquerading** you can hide private networks from the outside world behind one official IP address.

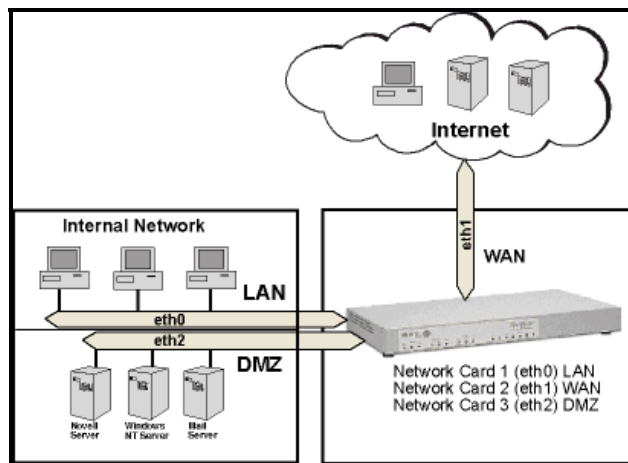
### About Interfaces

During initial installation, the RouteFinder automatically recognizes the installed network card and adds them to the configuration.

**Important:** To change to an earlier configuration that you had saved, the RouteFinder must be re-installed. Use the **Tracking > Backup** function to read in the configuration you had set for the RouteFinder after the new installation.

The RouteFinder must be the interface between the LAN and the Internet. All information packets must pass through the RouteFinder.

We strongly recommend that you NOT put the interfaces of the RouteFinder physically together on one network segment via a hub or a switch, unless the segment is configured as a VLAN switch. To do so can lead to faulty ARP (Address Resolution Protocol) resolutions (ARP clash). Some operating systems (e.g., Microsoft Windows) cannot cope with this. That is why one network interface should be used per physical segment.



### About the Interface Screen

The first network card (eth0) is always the interface to the internal network (LAN). It is called the **trusted** network.

The second network card (eth1) is the interface to the external network (Internet). It is the **untrusted** network.

The RouteFinder must have at least these two networks active to protect separate networks or network segments from each other.

**Example:** The network cards could be connected in the following way:

Network card 1: INTERNAL (to the local network)

Network card 2: EXTERNAL (to the Internet)

Network card 3: DMZ1 (DMZ for server)

The host name and the default gateway must only be defined once. The host name is, for example, **FIREWALL.yourdomain.com**; the gateway could be your Internet router.

A suitable IP address must be entered for each network card. Let's assume that you are using a Class-C network for your internal network, in this case the entry for network card 1 could look like the following:

Description: INTERNAL


IP address: 192.168.2.1 (Default)

Net mask: 255.255.255.0 (Default)

The description is for clarity purposes and is used in all further configurations. Make sure that the RouteFinder IP address is entered as the default gateway in the protected networks.

## Network Setup > Interface

### Network Setup > Interfaces Screen (with Load Balancing Disabled)



[Home](#) | [Wizard Setup](#) | [Help](#) | [Logout](#)

**Network Setup**  
[Interface](#)  
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Network Setup >> Interface

**Local Host**  

Default Gateway

Host Name

[Save](#)

**WINS Server**  

WINS Server

[Add](#)

[Delete](#)

Network Cards			
	Card 1	Card 2	Card 3
Name	LAN (eth0)	WAN (eth1)	DMZ (eth2)
IP Address	<input type="text" value="192.168.2.1"/>	<input type="text" value="192.168.100.1"/>	<input type="text" value="192.168.3.1"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>	<input type="text" value="255.255.255.0"/>	<input type="text" value="255.255.255.0"/>
Proxy Arp on this interface	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Primary DNS Address	<input type="text"/>	<input type="text"/>	<input type="text"/>
Secondary DNS Address	<input type="text"/>	<input type="text"/>	<input type="text"/>
NIC Type	Realtek Semiconductor Co., Ltd. RTL-8139/8139C/8139C+	Realtek Semiconductor Co., Ltd. RTL-8139/8139C/8139C+	Realtek Semiconductor Co., Ltd. RTL-8139/8139C/8139C+
MAC Address	00:08:00:E8:1E:29	00:08:00:E8:1E:28	00:08:00:E8:1E:27
IRQ	11	12	10
IO Port Info	e000	e100	e200
	<a href="#">Save</a>	<a href="#">Save</a>	<a href="#">Save</a>

**NIC Advanced Configurations**

Interface Name	Speed	Duplexity	Options
LAN	100Mb/s	Full	<a href="#">Change</a>
WAN	10Mb/s	Half	<a href="#">Change</a>
DMZ	10Mb/s	Half	<a href="#">Change</a>

**IP Aliases**

Interface	IP Address	Net Mask	
<input type="text" value="LAN(eth0)"/>	<input type="text"/>	<input type="text"/>	<a href="#">Add</a>
Existing IP Aliases			<a href="#">Delete</a>

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**Network Setup > Interfaces fields when Load Balancing is Enabled.**

Local Host	
WANLINK1 Gateway	65.126.90.1
WANLINK2 Gateway	192.168.3.1
Host Name	<input type="text" value="routefinder.yourdomain"/> <input type="button" value="Save"/>

NIC Advanced Configurations			
Interface Name	Speed	Duplexity	Options
LAN	100Mb/s	Full	<a href="#">Change</a>
WANLINK1	10Mb/s	Half	<a href="#">Change</a>
WANLINK2	10Mb/s	Half	<a href="#">Change</a>

**Default Gateway:**

A Default Gateway must be defined for the RouteFinder. A default address was set during installation. If you want to change it, enter the address in the text field using the dotted decimal format. Then click the **Save** button.

**Important Note:** If the gateway address and DNS addresses are assigned by a PPPoE server or a DHCP server or through a backup link, the address cannot be edited.

**Host Name:**

A local Host Name should also be defined for the RouteFinder. Enter the name in the Host name field using the *routefinder.yourdomain.com* format. Then click the **Save** button.

**Note:** The length of the Host Name should not be greater than 64 characters. For any problem with the Host Name settings, an alert message will display.

**Example:** localhost.localdomain.com

**WINS Server:**

If DHCP and PPPTP clients are to be assigned a WINS server address, enter the address here.

**Network Cards:****Interface Name:**

Each column allows you to identify the interfaces for the LAN, WAN, and DMZ networks (these are available when **Load Balancing** is **not enabled**).

When **Load Balancing** is **enabled**, the networks available are LAN, WANLINK1, and WANLINK2.

**IP Address:**

Enter the IP Address of the corresponding Network card. Then click the **Save** button.

The IP Address for the WAN link can be assigned in four ways:

1. Static assignment
2. PPPoE
3. DHCP client
4. PPP dial backup link

**Notes:**

- If the address/mask is assigned by a PPPoE server or a DHCP server or through a backup link on the Internet, the address/mask cannot be edited. Once the addresses are released by the servers, the addresses revert back to the old statically assigned ones.
- The same IP address cannot be entered for two different interfaces.

**Subnet Mask:**

Enter the corresponding net mask for the IP Address. Then click the **Save** button.

**Primary DNS Address:**

Enter the Primary DNS Address which is the address of the primary DNS server to be used by the local peer through the specific interface. Then click the **Save** button. This field can be left blank.



- Secondary DNS Address:** Enter the Secondary DNS Address, the address of the secondary DNS server to be used by the local peer through the specific interface. Then click **Save**. This field can be left blank. Note that a secondary DNS server cannot be configured without a primary.
- Proxy ARP on Interface:** Check this box to enable Proxy ARP on the interface. A router using Proxy ARP recognizes ARP requests for hosts on the other side of the router that cannot reply themselves. The router answers for those addresses with an ARP reply matching the remote IP address with the router's Ethernet address. This is typically used in scenarios where the other side is a subnet of a larger network.
- Note:** All packet filtering rules still apply when Proxy ARP is enabled. This is not a full bridging function!
- If the Proxy ARP on this Interface is activated, the RouteFinder will relay the ARP protocol on this network card for all the networks known to it.
- This function is necessary in some special cases; e.g., when the correct routes for a network cannot be set and the network has to be passed on through the firewall. This can be the case if you have no access to the router of your Internet provider.
- A Possible Error:** The Interface menu doesn't contain entry fields for all the network cards.
- Possible Cause of Error:** The missing network card was added after the installation of the RouteFinder or it wasn't recognized during installation.
- Solution:** Reinstall the RouteFinder software. You can use the backup feature (described earlier in this chapter) to transfer your configuration between the installations.

**NIC Type, MAC Address, IRQ, IO Port Info:** This information defaults into the corresponding fields.

- NIC Advanced Configurations:** In this section you can configure the Speed and Duplexity of the NICs. By default, the RouteFinder automatically detects the Speed and Duplexity of the NICs. If you want to change these values, click on the word *Change* and then select the new speed (10Mb/s or 100Mb/s) and the new Duplexity ((Full or Half). The changes can be ignored by clicking *Reset* in which case the RouteFinder will detect these values automatically.
- IP Aliases:** Multiple IP Addresses can be assigned to a network interface using IP Aliases. These IP Addresses are considered equivalent to the primary address of the network interface.
- Note:** The same IP address cannot be configured many times for an interface. Similarly, the same IP address cannot be entered as an IP Alias address for two different interfaces.

### Network Cards

**About Network Card 1 (LAN eth0) –** This is the internal network (LAN). The parameters were entered during initial installation. They can be changed.

**About Network Card 2 (WAN eth1) –** Network Card 2 is the interface to the external network (Internet). This network card (eth1)

**About Network Card 3 (DMZ eth2) –** This network card (eth2) is the interface to the optional DMZ network. A DMZ (De-militarized Zone) is a special LAN on the public network side of a firewall to allow a single WAN router to support both private (VPN) and public access to resources. Using a DMZ allows one IP Address (computer) to be exposed to the Internet. Some applications require multiple TCP/IP ports to be open. A DMZ allows just one computer to be exposed for that purpose. It is recommended that you set your computer with a static IP to use DMZ.

**Effect of Changes –** When you make a change that affects other administration functions and configurations, an informational screen displays that tells you the network interface you have just changed is used in several other configurations, and then the configurations affected by this change are listed for you. If the automatic changes are acceptable, continue editing. If the automatic changes are not acceptable, click your browser's **Back** button and continue.

## ***Network Setup > PPP***

The PPP link is used as a backup link to the WAN interface. If the PPPoE or static link goes down, the backup link will automatically come up and the system will be again connected to the ISP. On this screen you can set up PPP dial up backup for your WAN interface.

### ***PPP Settings***

#### ***Enable PPP Dial Backup for WAN***

To enable PPP Dial Backup for WAN, check the corresponding checkbox.

#### ***Baud Rate***

Select the baud rate from the drop down list box. Options: 9600, 19200, 38400, 57600, and 115200.

#### ***Serial Port***

Select the Serial Port from the drop down list box. Options: COM1 and COM2; use COM2.

#### ***Initialization String***

Enter the set of commands you want sent to the modem at startup. The initialization string sets speed, error correction, compression, various timeout values, and how to display results to the user. You can also change your country or region code by including the country/region code AT command in the initialization string (see directions on the next page).

#### ***Dial Number***

Enter the phone number that the modem will use to connect to the PSTN.

#### ***User Name***

Enter the ISP User Name designated for dialup access.

#### ***Password***

Enter the ISP Password designated for dialup access; the password is optional.

#### ***Enable IP Setting***

Check this box to enable the IP setting. This option can be set to make the firewall negotiate for a particular IP address from the ISP.

#### ***Local IP Address***

If the checkbox **Enable IP** is checked, the IP address has to be entered in this field.

#### ***Save***

Click **Save** to activate these settings.



## ***Change Your Country/Region Code***

You will need to use a terminal (or run a data communications program on your computer) to communicate with the modem and issue the commands. Use the following syntax, substituting the appropriate country/region code:

1. Type **AT%T19,0,*nn***, where *nn* is the country/region code in hexadecimal notation.  
Click **Enter**.  
**OK** displays.
2. Then save the changes by issuing the following command:  
**AT&F&W**  
Click **Enter**.
3. To verify that the correct country/region has been configured, type:  
**ATi9**  
Click **Enter**.
4. The country/region code displays:  

<b>Example:</b>	<b>Country/Region</b>	<b>AT Command (hexadecimal)</b>	<b>Result code (decimal)</b>
	Euro/NAM	AT%T19,0,34 (default)	52

A list of country/region codes can be found on the Multi-Tech Web site at:

[http://www.multitech.com/PRODUCTS/Categories/Device\\_Networking/global\\_modems/approvals.asp](http://www.multitech.com/PRODUCTS/Categories/Device_Networking/global_modems/approvals.asp)

## **Network Setup > PPPoE**

PPPoE (Point-to-Point Protocol over Ethernet) is a specification for connecting multiple computer users on an Ethernet local area network to a remote site through DSL or cable modems or similar devices. PPPoE can be used to have an office or building-full of users share a common Digital Subscriber Line (DSL), cable modem, or wireless connection to the internet. PPPoE combines the Point-to-Point (PPP), commonly used in dialup connections, with the Ethernet protocol which support multiple users in a local area network.

**Important:** If DHCP client is enabled, the PPPoE cannot be used. The internet connection can be either PPPoE or DHCP client at any given time.

### **PPPoE when Load Balancing is Disabled**

### **PPPoE when Load Balancing is Enabled**

### **PPPoE on eth1 (WAN)**

#### **Enable PPPoE on eth1 or Enable PPPoE on WANLINK1 (eth1)**

To enable PPPoE on eth1, check the corresponding box. This will enable the interface connected to the ADSL modem (this will be the interface to the internet).

#### **User Name**

This field defines the ADSL User Name given by the ISP.

#### **Password**

The user's password must be entered in this field.

#### **MTU**

The value entered here will cause PPPoE to set the TCP maximum segment size. The default value is 1412. The allowed range of values is 536 to 1452.

#### **DNS Address from Peer**

Check this box if you want to obtain DNS server addresses from the peer (i.e., the ISP).

#### **Save**

Click **Save** to activate these settings.

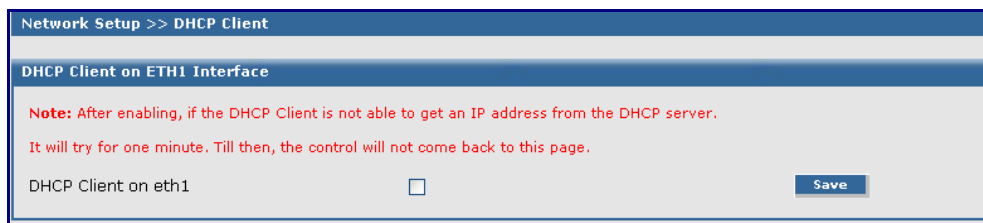
## Network Setup > DHCP Client

On this screen you can enable DHCP Client (Dynamic Host Configuration Protocol), which is a TCP/IP protocol that enables PCs and workstations to get temporary or permanent IP addresses out of a pool from centrally-administered servers. This screen will provide user messages such as the one shown in red. Later, it will display the Current DHCP Client Status. For example: DHCP Client has not yet obtained an IP address from the DHCP server.

**Important:** If PPPoE is enabled, then DHCP client cannot be enabled. The interface to the internet can be either through PPPoE or DHCP client at any time.

If DHCP client is enabled and if the IP address has been assigned, then the following values will be displayed on this screen:

- Assigned IP Address
- Mask
- DHCP
- DNS Address
- Gateway Address
- Renew Time (time at which the DHCP client should begin trying to contact its server to renew the lease it has obtained).
- Expiry Time (time at which the DHCP client must stop using the lease if it has not been able to contact a server in order to renew it).



### DHCP Settings

#### DHCP Client on ETH1 Interface

To Enable DHCP Client on ETH1, check the corresponding checkbox.

**Note:** If you have Load Balancing enabled, there will be two DHCP Clients: DHCP Client on eth1 and DHCP Client on eth2.

#### Save

Click the **Save** button after enabling this function.

## ***Network Setup > Dynamic DNS (DDNS)***

Dynamic DNS allows a user to connect his PC to the Internet with a dynamic IP address, so that he will be able to use applications that require a static IP address.

The screenshot shows a window titled "Network Setup >> Dynamic DNS". Inside, there is a section titled "Dynamic DNS Settings". It contains several configuration options: "Dynamic DNS Client" with an unchecked checkbox, "User Name" with a text input field, "Password" with a text input field, "Dynamic DNS Server" with a text input field, "Domain Name" with a text input field, "Use Wildcard" with an unchecked checkbox, and "Custom DNS" with an unchecked checkbox. A "Save" button is located at the bottom right of the settings area.

### ***Dynamic DNS Settings***

#### ***Dynamic DNS Client***

Check the box to enable Dynamic DNS Client for this machine.

**Note:** If you have Load Balancing enabled, there will be two DDNS Clients: Dynamic DNS Client on WANLINK1 and Dynamic DNS Client on WANLINK2.

#### ***User Name***

Enter the name or the email ID you have specified while registering with the Dynamic DNS server.

#### ***Password***

Enter the password you had specified while registering with the Dynamic DNS server.

#### ***Dynamic DNS Server***

Enter the server to which you have registered for dynamic DNS service.

At present, only the following servers are supported for this function:

- dyndns.org
- zoneedit.com
- easydns.com
- hn.org
- dslreports.com
- dnspark.com

#### ***Domain Name***

Enter the domain name which you have registered with the Dynamic DNS server.

#### ***Use Wildcard***

If you enable this option, sub domains of the domain you have registered will also be resolved to the same IP address.

For example, if you have registered test.dyndns.org, and the IP address assigned to it is resolved to a.b.c.d, all the sub domains (e.g., dns.test.dyndns.org) will also be resolved to a.b.c.d.

## ***Network Setup > Routes***

Routing information is used by every computer connected to a network to identify whether it is sending a data packet directly to the Firewall or passing it on to another network. There are two types of routes used by the firewall, interface routes that describe routing entries for directly connected networks and static routes that describe routes which are to be routed using a secondary router. You can add and delete entries in both these type of routes.

The RouteFinder itself adds routing entries for directly connected networks. These routes are called Interface Routes. Further entries for networks in which the RouteFinder itself is NOT a member must be made manually (e.g., if there is a second router on the network and a particular network is to be routed to it, for example if the second router is to be responsible for this network).

### **Add Routes**

#### **Interface Route**

Select an already defined network and a network card. The entries are confirmed by clicking the **Add** button. Also, existing entries can be deleted by highlighting the entry and clicking the **Delete** button.

**Note:** While adding a route, if the network cannot be reached through that interface, the route will not be added.

#### **Add Routes - Static Route**

This selection defines networks that are not directly connected, but are connected through a secondary router or gateway. Select an already defined network for the drop-down list. Enter the external IP address which will act as a gateway for this network. Confirm your entry by clicking the **Add** button. Existing entries can be deleted by highlighting the entry and clicking the **Delete** button.

**Note:** The specified gateway should be reachable first. This means that a static route should already be configured for the gateway.

#### **Delete a Route**

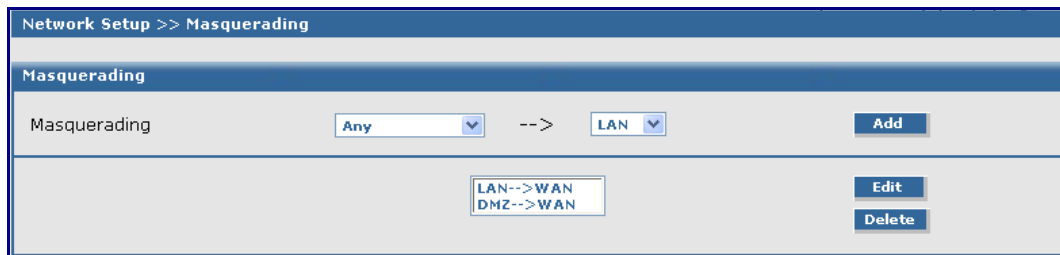
Select a Route from the table and click the **Delete** button. When deleting a Route, the interface adapts accordingly.

**Note:** You can view the Routing Table in **Statistics & Logs > Networks > Routing Table**.

## ***Network Setup > Masquerading***

Masquerading is a process which allows a whole network to hide behind one or several addresses preventing the identification of your network topology from the outside. Masquerading enables the user to enter only one source network. All services are automatically included in the transition. The translation takes place only if the packet is sent via the indicated network interface. The address of this interface is used as the new source of the data packets.

On this screen you can select networks or network groups to be masked to selected network cards. Masquerading is especially useful for connecting private networks to the Internet. It allows you to hide internal IP addresses and network information from the outside network.



### ***Masquerading***

#### ***Masquerading***

Select one of the networks already defined in the Networks menu. Select a network from each box (**from** and **to** networks).

The options are Any, LAN, WANInterface, WAN, DMZ Interface, and DMZ when Load Balancing is disabled.

The options are Any, LAN, WANLINK1 Interface, WANLINK1, WANLINK2 Interface, WANLINK2 and when Load Balancing is enabled.

#### ***Add***

Click the **Add** button. The Masqueraded network route displays below.

#### ***Edit or Delete a Route***

Select Masqueraded network route from the lower box and click the **Edit** or **Delete** button.

When deleting a Masqueraded network route, the interface adapts accordingly.

#### ***Example***

In this example, the sent packet does not contain any internal information. The reply to the request is recognized by the RouteFinder and is passed on to the requesting computer.

Computer A with the address XY is inside a masked network within the RouteFinder.

It starts an HTTP request into the Internet. Computer A - and all computers in this network - use the only official IP address. For all data packets that are to go into the Internet, the IP address of the sender is exchanged for the IP address of the external network card.

## Network Setup > SNAT

The SNAT (Source Network Address Translation) process allows attaching private networks to public networks. SNAT is used when you want to have a LAN using a private IP network to be connected to the internet via a firewall. Since the private IP addresses are not routed on the internet, you have to apply SNAT on the firewall's external interface.

The firewall's internal interface serves as the default gateway for the LAN. Hence, a rule is added to the firewall to replace the source address of all packets crossing the firewall's external interface from inside to outside with the firewall's own IP address. Once the request gets answered from the Internet host, the firewall will receive the reply packets and will forward them to the client on the LAN.

On this screen you can set up the RouteFinder's ability to rewrite the source address of in-transit data packages using SNAT. This functionality is equivalent to DNAT, except that the source addresses of the IP packets are converted instead of the target addresses being converted. This can be helpful in more complex situations (e.g., diverting reply packets of connections to other networks or hosts).

### Important

For SNAT support, the TCP and/or UDP settings must be enabled at **Networks & Services > Services > Protocol**.

### Important

As the translation takes place after the filtering by packet filter rules, you must allow connections that concern your SNAT rules in **Packet Filters > Packet Filter Rules** with the original source address. Packet filter rules are covered later in this chapter.

**Note:** To create simple connections from private networks to the Internet, you should use the **Network Setup > Masquerading** function instead of SNAT. In contrast to Masquerading, SNAT is a static address conversion, and the rewritten source address does not have to be one of the RouteFinder's IP addresses.

**Screen Note:** If you do not have Failover enabled, *Failover Status* and related note will not display.

Failover Status	No	Pre SNAT Source	Service	Destination	Post SNAT Source	Command

### Add SNAT Definition

From the drop down list boxes, select IP packet characteristics to be translated. The options are:

#### Pre SNAT Source

Select the original source network of the packet. The network must be predefined in the **Networks** menu. The entry is confirmed by clicking the **Add** button. Existing entries can be deleted or edited by clicking the **Edit** or the **Delete** buttons.

The options are Any, LAN, WANInterface, WAN, DMZ Interface, and DMZ when Load Balancing is disabled.

The options are Any, LAN, WANLINK1 Interface, WANLINK1, WANLINK2 Interface, WANLINK2 and when Load Balancing is enabled.

#### Service

Allows the corresponding service for the Pre SNAT Source entry field to be chosen from the select menus. The service must have already been defined in the **Services** menu.

#### Destination

Select the target network of the packet. The network must have been defined in the **Network** menu. The entry is confirmed by clicking the **Add** button. Existing entries can be deleted or edited by clicking the **Edit** or the **Delete** buttons.

#### Post SNAT Source

Selects the source addresses of all the packets after the translation. Only one host can be specified here. The entry is confirmed by clicking the **Add** button. Existing entries can be deleted or edited by clicking the **Edit** or the **Delete** buttons.

## Network Setup > DNAT

DNAT (Destination Network Address Translation) describes the target addresses of the IP packets for DNAT re-routing. Use DNAT if you want to operate a private network behind your RouteFinder firewall and provide network services that run only behind this private network available to the Internet. Note that for DNAT support, the TCP and/or UDP settings must be enabled (see **Networks & Services > Services > Protocol**).

### Important Notes:

- You **cannot** add a DNAT rule with the Pre-DNAT Network as ANY, a Service as ANY, and a Destination Service as ANY. If you do this, all the packets will be routed to the system with Post SNAT network, and then the services in the firewall will not function properly.
- The address conversion takes place BEFORE the filtering by the packet filter rules; therefore, you must set the appropriate rules in the **Packet Filter > Rules** menu to let the already-translated packets pass. You can find more about setting packet filter rules earlier in this chapter.

No	Pre DNAT Network	Pre DNAT Service	Post DNAT IPAddress	Post DNAT Service	Command
	LAN	Any	WANInterface	Any	

### Add DNAT Definition

The DNAT screen contains four drop down list boxes. The first two define the original target of the IP packets that are to be re-routed. The last two define the new target to which the packets are forwarded. From the drop down list boxes, select IP packet characteristics to be translated.

#### Pre DNAT Destination

Select the original target Network/Host and the corresponding Service (e.g., FTP, FTP-CONTROL) to be redirected.

#### Post DNAT Destination

Select a network/host to which the IP packets are to be diverted. Only one host can be defined as the Post DNAT destination.

**Important:** If you are using a port range as the Post DNAT Service, you must enter the same Service definition as you entered in the Pre DNAT Service. In other words, you can only map one port range to the same port range. Select a corresponding Service (e.g., DNS, FTP, FTP-CONTROL) to be redirected.

#### Add, Edit, Delete

Click the **Add** button to save your choices. After saving the settings, a table is created. You can edit or delete entries by highlighting the desired entries and clicking **Edit** or **Delete** listed under **Command**.

### DNAT Example

Your Internet/private network has the address range 192.168.0.0/255.255.255.0. Now, make a Web server that is running on port 80 of server with the IP Address 92.168.0.20 accessible to clients outside your LAN. These clients cannot contact its address directly, as the IP address is not routed directly to the Internet. With DNAT, you can re-route port 80 on the RouteFinder's external interface onto the Web server.

**Note:** To divert port 443 (HTTPS), you must change the value of the TCP port on the **Administration > Administrative Access** screen in the field **Administrative Access HTTPS Port** (e.g., port 444).

### Examples of DNAT Network Combinations

You can map:

- IP/Port ⇒ IP/Port
- IP/Port-Range ⇒ IP/Port
- IP/Port-Range ⇒ IP/Port-Range (only if the Port-Range is the same for PRE and POST)
- IP-Range/Port ⇒ IP/Port
- IP-Range/Port-Range ⇒ IP/Port

You cannot map:

- IP ⇒ IP
- IP-Range ⇒ IP
- IP-Range ⇒ IP-Range
- IP ⇒ IP-Range (load balancing)

The "way back" (return) translation is done automatically; you do not need a rule for it.



## ***Network Setup > Load Balancing***

Load Balancing distributes LAN-to-LAN traffic over two or more WAN links. This allows for the amount of traffic on each line to be based on a specified weighed value so that communication can be made faster and more reliable.

**Important Note:** If you check Enable Load Balancing, the following message displays:  
***Enabling Load Balancing will delete the spoofing rules between WAN and DMZ.***

Network Setup >> Load Balancing

Load Balancing Over Multiple Links

Enable Load Balancing ☒ Save

**Add WANLINK1 (eth1)**

IP Address

Subnet Mask

Gateway

Primary DNS Address

Secondary DNS Address

Weight

**Add WANLINK2 (eth2)**

IP Address

Subnet Mask

Gateway

Primary DNS Address

Secondary DNS Address

Weight  Save

Ping Keep Alive Host1  Save

Ping Keep Alive Host2  Save

Allow spoofing on the interfaces ☐ Save

### ***Load Balancing Over Multiple Links***

#### ***Enable Load Balancing***

Check the box and click **Save** to enable load balancing.

#### ***Add WANLINK1 (eth1) & Add WANLINK2 (eth2)***

##### ***IP Address***

Enter the IP address of WANLINK1 and WANLINK2. The IP addresses can be assigned in four ways:

- Static assignment
- PPPoE
- DHCP client
- PPP dial backup link

##### ***Important Notes about IP Addresses***

- The same IP address cannot be entered for two different interfaces
- Assigning of the IP address through PPP dial backup is applicable only for WANLink1 (eth1).

### **Subnet Mask**

Enter the Subnet Mask of WANLINK1 and WANLINK2.

#### **Important Notes about IP Address and Subnet Mask**

- If the address/mask is assigned by PPPoE, a DHCP server, or through a backup link on the Internet, the address/mask cannot be edited. Similarly, if the gateway address and the DNS addresses are assigned by a PPPoE server or a DHCP server, the values cannot be edited.
- Once the addresses are released by the servers, the values will revert back to the old statically assigned values.

### **Gateway**

Enter the corresponding gateway for the WANLINKs.

### **Primary DNS Address**

Enter the Primary DNS Address which is the address of the primary DNS server to be used by the local peer through the specific interface. Then click the **Save** button. This field can be left blank.

### **Secondary DNS Address**

Enter the Secondary DNS Address which is the address of the secondary DNS server to be used by the local peer through the specific interface. Then click the **Save** button. This field can be left blank.

**Note:** A secondary DNS Address cannot be configured without a primary address.

### **Weight**

Enter a numeric value from 1 to 10 in the Weight field. This value sets the number of data packets to be sent/received by WANLINK1 before the communication process is transferred to WANLINK2.

A value of 3 for each WANLINK seems to work well. However, if one WANLINK is faster than the other, then you might want to enter a higher number for that link; e.g., use a 3:1 ratio.

When you have completed the entries for WANLINK1 and WANLINK2, click Save.

### **Ping Keep Alive Host1 & Host2**

The URL of Web site entered here is used to see whether or not the Internet can be reached through the interface.

Enter the *Ping Keep Alive Host* address. Then click **Save**.

### **Allow Spoofing on the Interfaces**

If you enable this feature, the interfaces will allow packets with a source address belonging to WANLINK1 to be sent out through WANLINK2 and vice versa. This is important when the WANLINK1 and WANLINK2 subnets are different.

To enable spoofing, check the box, and then click the **Save** button.

## Network Setup > High Availability

The High Availability module allows you to configure two RouteFinders to form a cluster to provide high availability and reliability. The two RouteFinders act in active-standby configuration. They are setup as Master and Slave. Master provides all the services, and Slave stands by waiting to take over if Master fails. Slave then takes over all the resources and starts to serve. After the Master comes back up again, it takes back all the resources and starts to serve again.

### Components of High Availability

The High Availability module contains components that provide the RouteFinder a fail-safe capability, a virtual IP Address on the LAN that forms the Cluster IP and a Configuration Synchronization module. The configuration of High Availability is highly critical to its functionality, and a slight misconfiguration can render the RouteFinder unusable. Therefore, great care must be taken when configuring High Availability.

**Complete this screen the following order:**

- Status in Cluster
- High Availability Configuration
- Cluster IP Address
- High Availability Status
- Synchronous Configuration

Network Setup >> High Availability	
<b>High Availability Status</b>	
Status	<input type="checkbox"/> <span>Save</span>
Do not Enable High Availability before configuring the parameters required	
<b>Master/Slave Configuration</b>	
Status in Cluster	<input checked="" type="radio"/> Master <input type="radio"/> Slave
<b>High Availability Configuration</b>	
<b>High Availability Configuration</b>	
Hostname of Slave	<input type="text"/>
IP Address of Slave	<input type="text"/>
Synchronization Interval	Thirty Minutes <span>▼</span>
<span>Save</span>	<span>Advanced</span>
<b>Cluster IP Address</b>	
Cluster IP Address is to be used for accessing the cluster, should be different from the LAN IPs of the two RouteFinders	
LAN IP	<input type="text"/> <span>Save</span>
<b>Synchronization Configuration</b>	
Create Sync Key and Download	<span>Create Key &amp; Download</span>
Synchronize Configuration to Slave	<span>Synchronize Now</span>

### High Availability Status

#### Status

Check the Status box to enable High Availability. **Note: Do NOT check** this box until the parameters for *Status in Cluster*, *High Availability Configuration*, and *Cluster IP Address* have been set. If you accidentally check the Status box before entering these parameters, simply uncheck it and click **Save** again.

### Master / Slave Configuration

#### Status in Cluster

Select either Master or Slave to indicate whether the RouteFinder is to act as a Master or Slave in the current cluster.

## **High Availability Configuration**

### **Host Name and IP Address of Master / Slave**

If Master was selected above, this section of the screen will request you to enter the Slave full host name or FQDN and the IP Address of the peer (in this case the Master RouteFinder).

If Slave was selected above, this section of the screen will request you to enter the Master full host name or FQDN and the IP Address of the peer (in this case, the Slave RouteFinder).

### **Synchronization Interval**

Select the time interval between two syncs. Select from Thirty Minutes, Hourly, Daily, or Weekly.

### **Advanced Button**

This button opens a screen for advanced users only. The screen contains various fields for fine tuning HA parameters.

### **Cluster IP**

Currently, High Availability is provided for the LAN only. In this text box, enter the IP address to be used for accessing various RouteFinder services on the LAN.

#### **Important Notes:**

- This IP must belong to the LAN network and should not belong to any host on the network or the RouteFinder.
- This address must be the same on both primary and the secondary RouteFinders.

## **Synchronization Configuration**

To be able to transparently synchronize configuration between two RouteFinders you need to exchange a key between them. This key must be generated on the primary RouteFinder and then copied to the secondary. To do this, two buttons are provided:

### **Create Key and Download**

Click this button to create a Sync key on the Primary RouteFinder and download it to the local PC. This option is available only on the **Master**.

### **Upload Key**

Click this button to upload the Sync key to the Secondary RouteFinder. Use the Browse button to find the “key” on your local PC. This option is available only on the **Slave**.

### **Synchronize Configuration to Slave (or Master)**

Click this button to synchronize the configuration to the peer system. SSH should be enabled on the LAN for the synchronization to work.

## DHCP Server

### ***DHCP Server > Subnet Settings***

DHCP (Dynamic Host Configuration Protocol) is a protocol which allows individual devices on an IP network to get their own network configuration information (IP address, subnet mask, broadcast address, etc.) from a DHCP server. The overall purpose of the DHCP is to make it easier to administer a large network. The DHCP package includes the DHCP server and a DHCP relay agent.

The screenshot shows the MultiTech Systems web interface for DHCP Server Subnet Settings. The left sidebar has a menu with 'DHCP Server', 'Subnet Settings', and 'Fixed Addresses'. The main content area is titled 'DHCP Server >> Subnet Settings'. It includes a 'DHCP Server on LAN' section with a checked checkbox and a 'Save' button. Below this is an 'Add Subnet' section with an 'Add Subnet' button. At the bottom is a table with columns 'Subnet', 'Mask', and 'Options'. The table contains one entry: Subnet 192.168.2.0, Mask 255.255.255.0, with 'Edit' and 'Delete' links in the Options column.

Subnet	Mask	Options
192.168.2.0	255.255.255.0	<a href="#">Edit</a> <a href="#">Delete</a>

#### **DHCP Server on LAN**

##### **DHCP Server on LAN**

The DHCP Server is enabled by default. If you would like to disable it, uncheck the DHCP Server on LAN checkbox. If you change the check mark, click the **Save** button to activate the change.

##### **Add**

Click the **Add Subnet** button which will open the table for entering the Subnet IP Address and Mask.

##### **Edit or Delete**

You can edit or delete entries by selecting the desired entries and clicking either the **Edit** button or **Delete** button listed under **Options**.

### ***DHCP Server > Fixed Addresses***

The DHCP server can be made to assign a fixed IP address for a particular user by identifying the MAC address. This binding can be made permanent by configuring the same using this screen. The same IP address would not be used for any DHCP client with a different MAC address, even if there is no active DHCP connection with that IP address.

The screenshot shows the MultiTech Systems web interface for DHCP Server Fixed Addresses. The left sidebar has a menu with 'DHCP Server', 'Subnet Settings', and 'Fixed Addresses'. The main content area is titled 'DHCP Server >> Fixed Addresses'. It includes an 'Add Fixed Address' section with two input fields: 'MAC Address' and 'IP Address', and an 'Add' button.

#### **DHCP Server Fixed Addresses**

##### **Add Fixed Address**

Enter both a MAC address and an IP address.

# Tracking

## *Tracking > Accounting*

The Accounting function records all packets through network interfaces. It also keeps track of the traffic from / to other IP addresses configured and sums up their byte sizes.

The traffic sum for each day and the current month is calculated. This is the amount that your ISP (Internet Service Provider) will charge to you if your payment plan is based on the amount of data you transfer.

On this screen you can specify which local devices will have their network traffic counted and recorded. You can also exclude hosts or networks from the accounting process.

After installing your RouteFinder, all networks are included in the accounting function. However, you can exclude Hosts or Networks from Accounting. This could be useful if the interface to the DMZ is entered in the Accounting while one particular computer in the DMZ is not to be accounted. If this one computer is only to be used for internal purposes, it does not make sense to include its information traffic in the accounting balance.

**Note:** The traffic will be displayed as graphs in **Statistics & Logs > Accounting**.

### **Accounting Device**

#### **Accounting Device**

From the Accounting Device drop down box, select the network to have its traffic counted. The options are **LAN**, **WAN**, and **DMZ**. Click the **Add** button to confirm your entry. After the entry is completed, a table for this network is created.

### **IP-Based Accounting**

#### **IP Address**

Enter the IP addresses for which traffic is to be monitored. The traffic to and from the particular IP address destined to one of the firewall's interfaces and the traffic to and from the particular IP address and forwarded by the firewall will be considered for accounting. Click the **Add** button.

### **VPN Accounting**

#### **VPN-Based Accounting**

Check the VPN Accounting Status box to have the VPN status monitored by the accounting function. Click the **Save** button.

## Tracking > Update Services

This purpose of this screen is to update services by downloading system upgrades from the specified update server. If you use the Update Service, your RouteFinder can be continually updated with new virus protection patterns, system patches, security features, and new features.

Update resolves dependencies between modules during the update procedure. It will only download new packages or packages that are newer than the packages currently present on the RouteFinder. The patterns and URL categories database can also be updated.

**System Update** service uses FTP connections to download packages.

Tracking >> Update Services	
<b>System Update Server</b>	
Server Name	<input type="text" value="ftp.multitech.com"/>
Directory	<input type="text" value="/autoupdate/flash"/> <input type="button" value="Save"/>
<b>Virus Update Server</b>	
Server Name	<input type="text" value="ftp.kaspersky.ru"/>
Directory	<input type="text" value="updates"/> <input type="button" value="Save"/>
<b>Update Services</b>	
Update System	<input type="button" value="Start"/>
Current Version is <span style="color: red;">RouteFinder 3.32</span>	
<span style="color: blue;">Updation Successful</span>	
Update Virus Patterns	<input type="button" value="Start"/>
Update URL Categories database	<input type="button" value="Start"/>
<b>Time Interval for Automatic Update of Virus Patterns</b>	
Enable Update	<input type="checkbox"/>
Time Interval	<input type="text" value="Hourly"/> <input type="button" value="Save"/>
<b>Time interval for Automatic Update of URL Categories</b>	
Enable Update	<input type="checkbox"/>
Time Interval	<input type="text" value="Daily"/> <input type="button" value="Save"/>
<b>System Update Live Log</b>	
<input type="button" value="View System Update Live Log"/>	
<b>Virus Update Live Log</b>	
<input type="button" value="View Virus Update Live Log"/>	

### **System Update Server**

#### **Server Name and Directory**

Enter the name or IP address of the server you want to specify as the system update server and enter the path to this server. Click the **Save** button.

### **Virus Update Server**

#### **Server Name and Directory**

Enter the name or IP address of the server you want to specify as the virus database update server and enter the path to this server. This process downloads and installs new virus detection patterns for the firewall's virus scanner. To ensure that patterns stay up-to-date at all times, the process can be automated by setting a time interval after which the system automatically checks for virus pattern updates at the specified update server.

### **Update Services**

This section of the screen allows you to start the update processes of these services. Click the **Start** button to Update **System**, **Update Virus Patterns**, and/or **Update URL Categories Database**. Note that the Current Version and Updates will display.

#### **Time Interval for Automatic Update of Virus Patterns**

Your RouteFinder can be continually updated with new virus patterns (with optional email virus scan subscription), system patches, and security features that can be automatically read into your running system. The updates are signed and encrypted and read in via an encrypted connection. To setup an automatic virus update function, check the **Enable Update** checkbox. Then select the time interval after which the system automatically checks for the virus pattern updates at the specified update server. The time intervals are hourly, daily, weekly, and monthly.

#### **Time Interval for Automatic Update of URL Categories**

Your RouteFinder can be continually updated with new URL categories. To setup an automatic URL category update function, check the **Enable Update** checkbox. Then select the time interval after which the system automatically checks for URL category database updates from its server. The time intervals are daily, weekly, fortnight, and monthly.

### **System Update - Livelog**

After clicking the **System Update - Livelog** button, a list of all downloaded packages along with the download time will be displayed.

### **Virus Update - Livelog**

After clicking the **Virus - Livelog** button, a log file of the virus pattern updates will be displayed.



## Tracking > Backup

The Backup function lets you save the RouteFinder settings on a local hard disk. With a backup file, you can set a recently installed RouteFinder to the identical configuration level as an existing RouteFinder. This is useful in case there is a problem with your new settings. Also, a new RouteFinder can be installed and the backup read in minutes. This means a replacement system can be running in a very short time. The backup file contains all configuration settings except the VPN RSA Key.

**The Backup function is responsible for the following:**

1. Saves your firewall settings as a zip file.
2. Sends the backup as an attachment to an email to the administrator.
3. Allows you to import the backup either from the firewall or the browser machine. In this case, the settings will revert back to the settings saved in the corresponding zip file.
4. Allows you to download the backup from the firewall directly to your browser machine.

### Important Notes About Backups:

- You will probably want to keep routine backups of all aspects of your RouteFinder to let you re-build it in case of an emergency, as well as to use as evidence if and when you discover a successful attack (letting you compare the before and after states of the RouteFinder).
- You may want to store all alerts and notifications.
- Passwords are saved, but the RSA key is not saved.

Tracking >> Backup	
<b>Backup</b>	
Comments for Export Backup	<input type="text"/> <b>Save</b>
Import Backup from Firewall/VPN	<b>Import</b>
Import Backup from Remote Client	<b>Import</b>
Download Backup	<b>Download</b>
<b>Status</b>	
Enable Periodic Backup	<input checked="" type="checkbox"/> <b>Save</b>
Interval for Periodic Backup	<b>Weekly</b>
Maximum Backups to store	<input type="text" value="1"/>
Adaptive Message Database Backup	<input type="checkbox"/> <b>Save</b>

### Backup

#### Comments for Export Backup

This field is a required field. Enter an explanation of the backup file for future reference. Click **Save**. This starts the backup and includes the comment as part of the backup file. The file name generated by the RouteFinder is made up of backup's date and time in the format *yyyy-mm-dd.hh-mm.zip*. The file is saved to your hard drive and can be emailed.

**Caution:** When reading in the backup file, the RouteFinder automatically configures itself as recorded in the backup file. For example, if IP addresses or passwords have since changed or have been forgotten, you might not be able to access the RouteFinder anymore.

#### Import Backup from Firewall/VPN

This function is used for restoring the configuration files from a backup file present in the firewall itself. After clicking the **Import** button, a list of all the backup files maintained in the firewall will be displayed. Select the file you want to import and click the **Get Comments** button to read the comments for this file and verify that this is the file you want. Once you are sure of the file you want, click the **Import** button. Passwords will be saved.

**Note:** Backups taken from a previous version cannot be imported.

***Import Backup from Remote Client***

When a backup is taken, the backup file is sent to the administrator through email. This function is used for restoring the configuration files from a remote client. After clicking the **Import** button, a list of all the backup files maintained on the remote client's PC display. Select the file you want to import and click the **Get Comments** button to read the comments for this file to verify that this is the file you want. Once you are sure of the file you want, click the **Import** button.

***Download Backup***

Click the **Download** button to backup files saved in the firewall to the local machine.

***Status******Enable Periodic Backup***

Place a checkmark in this box to set up an automatic performance of the periodic backups.

Click the **Save** button.

***Interval for Periodic Backup***

Select how often you would like automatic periodic backups to be performed. Options are daily, weekly, and monthly. Then click the **Save** button.

***Maximum Backup to Store***

Set the maximum number of backups that you want to be retained in the server. Enter a number between 1-20.

***Adaptive Database Backup***

Enables Adaptive Database Backup.

## Tracking > Version Control

These settings are the configuration management system settings. All configuration files can be saved in a repository in a CVS server. There are fields for setting the IP address of CVS server, user name, password, and the repository path. The corresponding user account and the directory structure should be created on the CVS server.

### CVS Settings

#### User Name

Enter the name of the user for whom the account will be created.

#### Password

Enter the password for this user.

#### IP Address

Enter the IP address of the server where the account for the user will be created.

#### Repository

Enter the repository path in the server where the files can be checked in.

### Examples

#### How to Create the CVS Server

1. Use a repository name of TEST (the repository name should always be in capital letters).
2. Let the path to the repository be: **/usr/local/cvs**
3. Create a repository in the server using the command: **cvs -d/usr/local/TEST init**
4. **Note:** A new directory cvsroot will be created under **/usr/local/cvs**.

#### Configuring the CVS Server

1. Add a group "CVS" to the system. Any user who needs to access the repository should be in this group.
2. Change the directory to /usr/local/cvs and set the repository's ownership and permissions as you want them to be for this group.
3. Then change the permissions of the CVSROOT directory to ug+rwX.
4. Now create the directory TEST under usr/local/cvs.

#### Setting Up a CVS Password Authentication Server

1. Make sure the lines "cvspserver 2401/tcp" and "cvspserver 2401/udp" are present in:
2. /etc/xinetd.d
3. Add a file named "cvspserver" containing the following information:

```
4. service cvspserver
{
    disable = no
    flags = stream
    wait = no
    user = root
    server = /usr/bin/cvs
    server_args = -f --allow-root=/usr/local/cvs pserver
    log_on_failure += USERID
    log_type = FILE /root/bin/temp
}
Restart xinetd
```

# Packet Filters

## **Packet Filters > Packet Filter Rules**

The Packet Filter is a key element of the RouteFinder. Packet filters are used to set firewall rules which define what type of data traffic is allowed across the RouteFinder's firewall. There are certain System Defined Rules that exist by default. You can specify whether particular packets are to be forwarded through the RouteFinder system or filtered. These rules are set with the help of network/host definitions and service definitions on the **Networks & Services** screen.

### **Prerequisites**

To be able to differentiate rules, the appropriate **Networks & Services > Service Groups** and **Networks & Services > Network Groups** must first be defined.

The screenshot shows the MultiTech Systems RouteFinder web interface. The top navigation bar includes links for Administration, Networks & Services, Proxy, Network Setup, DHCP Server, Tracking, Packet Filters, VPN, and Statistics & Logs. The left sidebar has links for Packet Filters, Packet Filter Rules, ICMP, Advanced, Enable/Disable Log, and QoS. The main content area is titled 'Packet Filters >> Packet Filter Rules' and includes a 'Show Packet Filter Rules' section with a 'Show' button. Below this is a 'System Defined Rules' table with columns for Status, From, Service Group, To, Action, and Remarks. The table contains one rule: a checked status, 'LAN/DMZ' as the source, 'default\_outbound' as the service group, 'WAN' as the destination, and 'ACCEPT' as the action, with the remark 'Allow Outbound Access'. Below the table is an 'Add User Defined Packet Filter Rules' section with dropdown menus for From (Host/Networks), Service/Service Group, To (Host/Networks), and Action, and an 'Add' button. At the bottom is a table with columns for No., From (Host/Networks), Service/Service Group, To (Host/Networks), Action, and Command. The table contains one rule: '1', 'LAN', 'Any', 'Any', 'ACCEPT', and 'Edit Delete'.

Status	From	Service Group	To	Action	Remarks
<input checked="" type="checkbox"/>	LAN/DMZ	default_outbound	WAN	ACCEPT	Allow Outbound Access

No.	From (Host/Networks)	Service/Service Group	To (Host/Networks)	Action	Command
1	LAN	Any	Any	ACCEPT	Edit Delete

### **Show Packet Filter Rules in Popup Window**

When you click **Show**, the screen expands to show the existing packet filter rules.

The RouteFinder's behavior is determined by the content and order of the filter rules. The filter rules are assigned by column number (column **nr**). Every incoming data packet is checked, in order, as to whether rule 1 is valid; rule 2 is valid, etc.) As soon as a correspondence is found, the procedure as determined is carried out. You can **Accept, Drop, Reject, Log** the packets. When packets are rejected, an entry in the appropriate log file occurs.

All rules are entered according to the principle: **From Client - Service - To Server - Action**.

When setting packet filters, the two fundamental types of security policies are:

- All packets are allowed through – **Rules Setup** has to be informed explicitly what is forbidden.
- All packets are blocked – **Rules Setup** needs information about which packets to let through.

Your RouteFinder default is the all packets are **blocked** setting, as this procedure can achieve an inherently higher security. This means that you explicitly define which packets may pass through the filter. All other packets are blocked and are displayed in the **Filter LiveLog**.

**Example:** Network A is contained in network B.

Rule 1 allows network A to use the SMTP service.

Rule 2 forbids network B to use SMTP.

**Result:** Only network A is allowed SMTP. SMTP packets from all other network B IP addresses are not allowed to pass and are logged.

**Caution:** Re-sorting the rules may change how the RouteFinder operates. Be very careful when defining the rule set. It determines the security of your RouteFinder. If one rule applies, the subsequent ones are ignored. Therefore, the sequence is very important. **Never** place a rule with the entries **Any – Any – Any – Accept** at the top of your rule set, as such a setting will match all packets, and thus, cause all subsequent rules to be ignored.

### System Defined Rules

These rules define a set of common application services that are allowed outbound access through the RouteFinder's WAN interface. The software defines a default Service Group called **default\_outbound**. Services under **default\_outbound** are FTP, TELNET, SMTP, DNS, HTTP, POP3, IMAP, and HTTPS.

### Add User Defined Packet Filter Rules

Packet filter rules are created by choosing from four drop-down lists. All services, networks, and groups previously created in **Definitions** are available for selection. Click **Add** to create the appropriate rule; it then displays at the bottom of the table. The new rule automatically receives the next available number in the table. The overall effectiveness of the rule is decided by its position in the table. You can move the new rule within the table with the **Move** function in the **Command** column.

#### Important:

The order of the rules in the table is essential for the correct functioning of the firewall. By clicking the **Move** button, the order of execution can be changed. In front of rule to be moved, enter the line number that indicates where the rule should be placed. Confirm by clicking **OK**.

By default, new rules are created at the end of the table.

**From** – Select the network from which the information packet must be sent for the rule to match.

You can also select network groups. The Any option can also be given which matches all IP addresses, regardless of whether they are officially assigned addresses or so-called private addresses. These Network clients or groups must be pre-defined in the Networks menu. **Example:** Any, LAN, WANLINK1. Options changed if Load Balancing is enabled.

**Service** – Select the service that is to be matched with the rule. These services are pre-defined in the Services menu. With the help of these services, the information traffic to be filtered can be precisely defined. The default entry Any selects all combinations of protocols and parameters (e.g., ports). **Example:** SMTP, ANY

**To** – Select the network to which the data packets are sent for the rule to match. Network groups can also be selected. These network clients or groups must be pre-defined in the Networks menu.

**Action** – Select the action that is to be performed in the case of a successful matching (applicable filter rule). There are three types of actions:

- **Accept:** Allows/accepts all packets that match this rule.
- **Reject:** Blocs all packets that match this rule. The host sending the packet will be informed that the packet has been rejected.
- **Drop:** Drops all packets that match this rule, but the host is not informed. Use *Drop* for filter violations that constantly take place, are not security relevant, and only flood the LiveLog with meaningless messages (e.g., NETBIOS-Broadcasts from Windows computers).
- To drop packets with the target address Broadcast IP, define the appropriate broadcast address in the form of a new network in the Networks menu (defining new networks is explained in detail earlier in this chapter). Then set and enable the packet filter rule.

<b>To Broadcast on the Whole Internet:</b>	<b>To Broadcast on One Network Segment:</b>
<ol style="list-style-type: none"> <li>1. Open the <i>Networks &amp; Services</i> menu, click <b>Add</b>, and enter the following data:  <b>Name:</b> Broadcast32  <b>IP Address:</b> 255.255.255.255  <b>Subnet Mask:</b> 255.255.255.255</li> <li>2. Confirm by clicking the <b>Add</b> button.</li> <li>3. Open the <i>Rules</i> menu in the <i>Packet Filter</i> directory and set the packet filter rules:  <b>From (Client):</b> Any  <b>Service:</b> Any  <b>To (Server):</b> Broadcast32  <b>Action:</b> Drop</li> <li>4. Confirm by clicking the <b>Add</b> button.</li> </ol>	<ol style="list-style-type: none"> <li>1. Open the <i>Networks &amp; Services</i> menu, click <b>Add</b>, and enter the following data:  <b>Name:</b> Broadcast8  <b>IP Address:</b> 192.168.0.255  <b>Subnet Mask:</b> 255.255.255.255</li> <li>2. Confirm by clicking the <b>Add</b> button.</li> <li>3. Open the <i>Rules</i> menu in the <i>Packet Filter</i> directory and set the packet filter rules:  <b>From (Client):</b> Any  <b>Service:</b> Any  <b>To (Server):</b> Broadcast8  <b>Action:</b> Drop</li> <li>4. Confirm by clicking the <b>Add</b> button.</li> </ol>

#### Add

Confirm your entry by clicking the **Add** button. After a successful definition, the rule is always added to the end of the rule set table. Entries can be edited by clicking the **Edit** button, which loads the data into the entry menu. The entries can then be edited. The changes are saved by clicking the **Save** button.

#### Delete

Rules can be deleted by clicking the **Delete** button.

## Packet Filters > ICMP

**ICMP** (Internet Control Message Protocol) is necessary to test network connections and to test functionality of your firewall. It is also used for diagnostic purposes.

ICMP-forwarding and ICMP-on-firewall always apply to all IP addresses (“Any”). When these are enabled, all IPs can ping the firewall (ICMP-on-firewall) or the network behind it (ICMP-forwarding). Separate IP addresses can then no longer be ruled out with packet filter rules. If the ICMP settings are disabled, separate IPs and networks can be allowed to send ICMP packets through the firewall by using appropriate packet filter rules.

Packet Filters >> ICMP		
<b>ICMP Forwarding</b>		
ICMP Forward	<input checked="" type="checkbox"/>	<b>Save</b>
<b>ICMP On Firewall</b>		
ICMP on LAN	<input checked="" type="checkbox"/>	
ICMP on WAN	<input type="checkbox"/>	
ICMP on DMZ	<input checked="" type="checkbox"/>	<b>Save</b>

### Firewall Options When Load Balancing Is Enabled

ICMP On Firewall	
ICMP on LAN	<input checked="" type="checkbox"/>
ICMP on WANLINK1	<input type="checkbox"/>
ICMP on WANLINK2	<input type="checkbox"/>

#### ICMP Forwarding

Check the ICMP Forward checkbox to enable the forwarding of **ICMP** packets through the RouteFinder into the local network and all connected DMZs. In this way you select whether an ICMP packet should be dropped or passed through to the local network and all connected DMZs.

If **ICMP forward** is enabled, ICMP packets go through all connected networks. Another use of ICMP forwarding is to allow ICMP packets to be forwarded to individual networks (set in **Packet Filter > Rules**). For this, **ICMP forward** in **Packet Filter > ICMP** must be disabled.

The status is activated by clicking the **Save** button.

#### ICMP on Firewall

Check the options you want enabled to send and receive **ICMP** packets directly by the RouteFinder. Then click the **Save** button.

**Note:** To be able to use the tools **Trace Route** and **Ping**, the function **ICMP on firewall** must be enabled. After a successful startup of the RouteFinder, it is recommended that you disable this rule so that the RouteFinder cannot be pinged anymore.

## ***Packet Filters > Advanced***

On this screen you can configure the advanced packet filter settings.

Packet Filters >> Advanced			
<b>H.323 Packets Passthrough</b>			
H.323 Packets Passthrough	<input type="checkbox"/>		<b>Save</b>
<b>PPTP Packets Passthrough</b>			
PPTP Packet Passthrough	<input type="checkbox"/>		<b>Save</b>
<b>IPSEC Passthrough</b>			
IPSEC Passthrough	<input type="checkbox"/>		<b>Save</b>
<b>Private Address for WAN Interface</b>			
Allow Private Address	<input type="checkbox"/>		<b>Save</b>
<b>Allow Strict TCP Connection Passthrough</b>			
TCP Strict	<input checked="" type="checkbox"/>		<b>Save</b>
<b>Stateful Packet Inspection</b>			
Strict	<input checked="" type="checkbox"/>		<b>Save</b>
<b>Drop Fragmented Packets</b>			
Drop Fragmented Packets	<input checked="" type="checkbox"/>		
Log (Dropped) Fragmented Packets	<input type="checkbox"/>		<b>Save</b>
<b>MAC Address Based Filtering</b>			
Name	Source MAC Address	Destination IP Address	Service
<input type="text"/>	<input type="text"/>	Any	Any
			ACCEPT
<b>Add</b>			
Name	Source MAC Address	Destination	Service
			Action
			Command

### ***H.323 Packets Passthrough***

Check this box to enable the forwarding of H.323 packets across the firewall. Click **Save**.

### ***PPTP Packets Passthrough***

Check this box to enable the forwarding of PPTP packet passthrough (PPTP NAT support). Click **Save**.

This includes two features:

1. Server behind the firewall and client on the Internet. DNAT of PPTP packets.
2. Clients behind the firewall and server on the Internet. SNAT / masquerading of PPTP packets.

### ***IPSEC Passthrough***

Check this box to enable the forwarding of IPsec packets across the firewall. Click **Save**.

### ***Private Addresses in WAN Interface***

#### ***Allow Private Addresses***

By default, packets from / via the WAN interface of the RouteFinder, destined to any private address, will be dropped. This option allows enabling/disabling of this feature. Click **Save** when you make a change.



**Allow Strict TCP Connection Passthrough****TCP Strict**

By default, packets with invalid flag combinations or TCP sequence numbers passing via the RouteFinder will be dropped. Check the *TCP Strict* box and click the **Save** button to allow these packets to passthrough instead of being dropped. To maintain the Strict TCP connection default, do not check this box.

**Stateful Packet Inspection****Strict**

By default, stateful packet inspection will be carried out; therefore, those packets found unclear will be dropped. This option allows enabling/disabling of this feature. Click **Save** when you make a change.

**Drop Fragmented Packets****Dropped Fragmented Packets**

Enables/disables dropping of IP fragmented packets.

**Log (Dropped) Fragmented Packets**

Check the *Log (Dropped) Fragmented Packets* checkbox to enable/disable the logging of dropped IP fragments by the RouteFinder firewall.

**MAC Address-Based Filtering**

With this option, you can filter / forward packets based on the source MAC address.

**Note:** MAC address-based rules will be applied to packets destined to the firewall and to packets forwarded by the firewall.

**Name**

Name of the MAC address filtering rule.

**Source MAC Address**

Mac Address of the source machine for which the filter rule has to be added.

**Destination IP Address**

IP Address of the destination host / network for which the filter rule has to be added.

**Service**

The protocol – port part for which the filter rule has to be added.

**Action**

Select whether you want the packet to be forwarded or dropped.



## ***Packet Filters > Enable/Disable Log***

On this screen you can enable/disable RouteFinder firewall logging.

**Prerequisite:** Enable **Logging** on the *Administration > System Setup > System Logging* screen.

Enable/Disable Logging	
Permitted Inbound Access Logs	<input type="checkbox"/>
Permitted Outbound Access Logs	<input type="checkbox"/>
All Access Requests Traversing Firewall Violating Security Policy	<input type="checkbox"/>
All Access Requests To Firewall Violating Security Policy	<input type="checkbox"/>
Log Access to admin port	<input type="checkbox"/>

Save

### ***Enable/Disable Logging***

#### ***Permitted Inbound Access Logs***

Check this box to enable the logging of all permitted inbound access requests from public (WAN) network clients that use a service hosted on the RouteFinder itself or on a private (LAN) or service (DMZ) server/host.

#### ***Permitted Outbound Access Logs***

Check this box to enable the logging of all permitted outbound access requests from private (LAN) and service (DMZ) network clients that use a service on a public (WAN) network server/host.

#### ***All Access Requests Traversing Firewall Violating Security Policy***

Check this box to enable the logging of all access requests from private (LAN), service (DMZ), and public (WAN) network clients to traverse the RouteFinder that violate the configured security policy.

#### ***All Access Requests to Firewall Violating Security Policy***

Check this box to enable the logging of all access requests from private (LAN), service (DMZ), and public (WAN) network clients to send traffic to the RouteFinder itself, that violate the configured security policy.

#### ***Log Access to Admin Port***

Check this box to enable the logging of all access requests from private (LAN), service (DMZ), and public (WAN) network clients to send traffic to the RouteFinder itself on the administrative access port.

## Packet Filters > QoS

QoS (Quality of Service) addresses the issue of providing guaranteed service on the basis of priority.

When a packet enters an interface, depending on the bandwidth available, the packets are either dropped or sent. In other words, it is based on “best effort” mechanism. IP does not provide a facility to either drop or send packets based on priority – it treats every packet the same. The QoS function adds priority to the dropping/sending of packets.

**Packet Filters >> QoS**

**QoS On Firewall**

QoS Status ☒ Save

**Show QoS LOG**

Show QoS Firewall Rules in Popup Window Show

**Uplink Bandwidth**

Uplink Bandwidth of WAN(In Kbit)   
Uplink Bandwidth of DMZ(In Kbit)   
Uplink Bandwidth of LAN(In Kbit)  Save

**Classes of Service**

Class	Bandwidth Share(in %)
High Priority Class	<input type="text" value="50"/>
Default Class	<input type="text" value="30"/>
Low Priority Class	<input type="text" value="20"/>

Save

**Level One Service Classification Rules**

Rule Name	Service	Class	Interface	
<input type="text"/>	<input type="text" value="AH"/>	<input type="text" value="HighPriority"/>	<input type="text" value="WAN"/>	<span>Add</span>

RuleName	Service	Class	Gateway	Command
----------	---------	-------	---------	---------

**Level One Network Classification Rules**

Rule Name	From	Class	Interface	
<input type="text"/>	<input type="text" value="Any"/>	<input type="text" value="HighPriority"/>	<input type="text" value="WAN"/>	<span>Add</span>

RuleName	From	Class	Gateway	Command
----------	------	-------	---------	---------

### Uplink Bandwidth Options When Load Balancing Is Enabled

**Uplink Bandwidth**

Uplink Bandwidth of WANLINK1(In Kbit)   
Uplink Bandwidth of WANLINK2(In Kbit)   
Uplink Bandwidth of LAN(In Kbit)

**QoS on Firewall****QoS Status**

Check the Status box to enable Quality of Service on the three interfaces: LAN, WAN, and DMZ. Then click the Save button. Clicking **Save** causes the entire screen to display.

**Show QoS Log****Show QoS Firewall Rules in Popup Window**

Click the **Show** button to view the QoS IP table rules.

**Uplink Bandwidth**

The bandwidth available to be shaped is configured here by entering the units in Kbits. Click **Save**.

**Classes of Service****Class – High Priority Class, Default Class, and Low Priority Class**

Parent classes default into these fields. Depending on the percentage share configured, the minimum guaranteed bandwidth is calculated. Click **Save** if you change the defaults.

**Level One Service Classification Rules**

The following values will configure the level one classification rules based on Service.

**Rule Name**

Enter a name that will identify the rule. It can be any name that will have meaning for you.

**Service**

Select the service for which the classification rule is set.

**Class**

Select the priority to be given to the rule.

**Interface**

Select the interface through which the packet goes.

**Add Button**

Click the **Add** button to add this rule. The rule will then display. From the display area, the can be edited or deleted.

**Level One Network Classification Rules**

The following values will configure the level one classification rules based on Networks.

**Rule Name**

Enter a name that will identify the rule. It can be any name that will have meaning for you.

**From**

Select the network for which the classification rule is set.

**Class**

Select the priority to be given to the rule.

**Interface**

Select the interface through which the packet goes.

**Add Button**

Click the **Add** button to add this rule. The rule will then display. From the display area, the can be edited or deleted.

**Level Two Rules**

Depending on the type of level one rule, related level two rules can be configured. For a service-based level one rule, there can be related service-based level two rules. Level two rules can have four levels of priority ranging from 1– 4.

For level one service rules, network rules will be configurable for level two, and vice versa for the network. This priority indicates the order in which the extra bandwidth is distributed.

# VPN (Virtual Private Networks)

## VPN > IPsec

### Introduction to Virtual Private Networks

A Virtual Private Network (VPN) is useful in situations where information is sent and received via the Internet and it is important that no third party can read or change that information. Such a connection is secured via VPN software that is installed at both ends of the connection. This software allows authentication, key exchange, and data encryption according to an open standard (IPsec).

The IPsec protocol suite, based on cryptographic technologies, provides security services at the IP network layer. It secures network traffic providing guaranteed security for any application using the network. It can be used to create private secured tunnels between two hosts, two security gateways, or a host and a security gateway.

#### The VPN Main Screen

Status	Connection Name	Local WAN IP	Local LAN	Remote Gateway IP	Remote LAN	Command

#### VPN IPsec Settings

##### VPN Status

Check the VPN **Status** checkbox to enable IPsec.  
Click the **Save** button.

#### Add a New Connection

##### Add IKE Connection

Click the **Add IKE Connection** button. A screen displays for setting up an IKE connection.

##### Add Manual Connection

Click the **Add Manual Connection** button. A separate screen displays for setting up a manual connection.

## Add an IKE Connection

The IKE protocol automatically negotiates protocols and encryption algorithms; it keys automatic exchange of keys.

### Add IKE Connection

#### Connection Name

Enter a text name that will identify the connection for you.

#### Compression

Check the compression checkbox to enable IPCOMP, the compression algorithm.

#### Perfect Forward Secrecy (PFS)

Check the PFS checkbox to enable PFS, a concept in which the newly generated keys are unrelated to the older keys). This is enabled by default.

#### Authentication Method

Check an authentication method, either Secret or RSA signatures.

#### Secret

If the authentication method is Secret, this field must be configured. The Secret must be agreed upon and shared by the VPN endpoints; it must be configured at both endpoints of the tunnel.

#### Select Encryption

Select the encryption method. 3DES is recommended.

**IKE Life Time**

The duration for which the ISAKMP SA should last is from successful negotiation to expiration. The default value is 3600 seconds and the maximum is 28800 seconds.

**Key Life**

The duration for which the IPSec SA should last is from successful negotiation to expiration. The default value is 28800 seconds and the maximum is 86400 seconds.

**Number of Retries**

Specify the number of retries for the IPSec tunnel. Enter zero for unlimited retries.

**Left NextHop**

Next Hop is the address of the next device in a routing table's path that moves a packet to its destination. Enter 0.0.0.0 to indicate that the device should use the routing table default.

**Local WAN IP**

Select the interface initiating the IPSec tunnel. Options available depend on whether or not Load Balancing is enable/disable.

**FailOver Required**

Check the box to enable VPN failover for the tunnel. When this field is enabled, the tunnel will "failover" onto the other interface if the local interface is down. For example, if the tunnel is configured on WAN 1 but the link goes down, the tunnel again comes up on the other link (i.e., WAN 2). Failover is possible only when the remote gateway is an FQDN (Fully Qualified Domain Name).

**Local LAN**

Local security gateway for which the security services should be provided. If the RouteFinder acts as a host, this should be configured as **None**.

**Remote Gateway IP or FQDN**

Interface where the IPSec tunnel ends. In the case of a Road Warrior with a Dynamic IP address, this should be configured to **ANY**. FQDN is a DNS resolvable fully qualified domain name with which identity the right peer can be identified. When FQDN is selected, the Remote Gateway IP should be blank.

**Remote LAN**

Remote security gateway for which the security services should be provided. If the remote end is the host, this should be configured as **None**.

**UID (Unique Identifier String)**

It is recommended that you accept the default to disable UID. UID is used only for compatibility purposes (other IPSec VPN gateways might require you to input a Local and Remote IPSec Identifier). **Note:** Local ID and Remote ID are active only when UID is enabled for the connection.

**Local ID**

Enter the local security gateway ID, if required.

**Remote ID**

Enter the remote security gateway ID, if required.

**NetBIOS Broadcast**

Check this option to enable broadcasts over the connection. It will allow computers on the network to share Microsoft file and printer sharing information.

## Add a Manual Connection

### Add Manual Connection

#### Connection Name

Enter a text name that will identify the connection for you.

#### Compression

Check the compression checkbox to enable IPCOMP, the compression algorithm.

#### Authentication Method

Decides the encryption and authentication algorithms to be used for the respective security services. Options are:

##### Authentication only:

1. AH using MD5 –128 bit key
2. AH using SHA1 – 160 bit key

##### Encryption only:

1. ESP (Encapsulating Security Payload) using AES
2. ESP using DES – 56 bit key
3. ESP using 3DES – 192 bit key

##### Encryption & Authentication:

1. ESP using 3DES for encryption and MD5 for authentication
2. ESP using 3DES for encryption and SHA1 for authentication
3. ESP using 3DES for encryption and AH MD5 for authentication
4. ESP using 3DES for encryption and AH SHA1 for authentication

**Note:** Encryption without authentication is not recommended since it is not secure.

#### SPI Base

Security Parameter Index identifies a manual connection. The SPI is a unique identifier in the SA (Secure Association – a type of secure connection) that allows the receiving computer to select the SA under which a packet will be processed. The SPI Base is a number needed by the manual keying code. Enter any 3-digit hexadecimal number, which is unique for a security association. It should be in the form 0xhex (a number between 0x100 - 0xff is recommended). If you have more than one manual connection, then the SPI Base must be different for each one.



**ESP Encryption Key (Espenckey)** - The VPN firewall box uses 3DES as its encryption algorithm. 3DES uses a 192 bit hexadecimal number as its encryption key.

**ESP Authentication Key (Espauthkey)** - The VPN firewall could use either MD5 or SHA1 for ESP authentication:  
MD5 - 128 bit key example: 0x0123456789012345678901234567890ab.  
SHA1 - 160 bit key example: 0x01234567890123456789012345678901234567890

#### **AH Key**

The VPN firewall could use either MD5 or SHA1 for authentication

MD5 - 128 bit key example: 0x0123456789012345678901234567890ab.

SHA1 - 160 bit key example: 0x01234567890123456789012345678901234567890

#### **Left NextHop**

*Next Hop* is the address of the next device in a routing table's path that moves a packet to it's destination. Enter 0.0.0.0 to indicate that the device should use the routing table default.

#### **Local WAN IP**

Select the Interface to initiate the IPSec tunnel (Left Security Gateway). Options are LAN, WAN, and DMZ.

#### **Local LAN**

This is the local security gateway for which the security services are to be provided. If the RouteFinder acts as a host, this should be configured as **None**.

#### **Failover Required**

Check the box to enable VPN failover for the tunnel. When this field is enabled, the tunnel will "failover" onto the other interface if the local interface is down. For example, if the tunnel is configured on WAN 1 but the link goes down, the tunnel again comes up on the other link (i.e., WAN 2). Failover is possible only when the remote gateway is an FQDN (Fully Qualified Domain Name).

#### **Remote Gateway IP**

This is the interface in which the IPSec tunnel ends. In the case of a Road Warrior with a Dynamic IP address, this should be configured as **ANY**.

#### **Remote LAN**

This is the remote security gateway for which the security services are to be provided. If the remote end is a host, this should be configured as **None**.

#### **NetBIOS Broadcast**

Check this option to enable broadcasts over the connection. It will allow computers on the network to share Microsoft file and printer sharing information.



## VPN > X.509 Certificates

X.509 is an International Telecommunication ITU-T and ISO certificate format standard. The last release of this standard was X.509 Version 3 in the year 1996. An X.509 certificate is a confirmation of identity by binding an entity's unique name to its public key through the use of a digital signature. It also contains the unique name of the certificate user. The certificate, issued by a certificate authority, contains information to protect data or to establish secure network connections.

When you click the **Add** buttons on this screen, secondary screens display.

The screenshot shows a web interface titled "VPN >> X.509 Certificates". It contains two main sections. The first section, "Certificate Authority Generation", has a light gray background and an "Add" button. The second section, "Certificate Generation", also has a light gray background and an "Add" button.

### Certificate of Authority Generation

A Certificate of Authority Generation screen opens when you click the **Add** button. On this screen, you can:

- Add a self-signed Certificate of Authority (CA) by entering the information necessary to identify your Certificate.
- Import a selected Certificate of Authority.
- Add a predefined Certificate of Authority.

### Certificate Generation

A Certificate screen opens when you click the **Add** button. On this screen, you can enter the file path and key file path. Then enter your password and click **Import**. The certificate is then installed.

## VPN > IPsec Bridging

IPsec Bridging is a concept by which two IPsec tunnels can be linked as if they form one single tunnel.

**Example** (In this example, there are two tunnels):

1. **tun1** between gateways **A** and **B** and
2. **tun2** between gateways **B** and **C**

If **A** and **C** have to communicate over a secure channel, then a third tunnel would have had to setup if IPsec Bridging was not used. But with IPsec Bridging, we can have them communicate through the existing tunnels, **tun1** and **tun2**.

The above concept can be extended to link more than two tunnels, provided they all have one common endpoint.

The common endpoint between tunnels is called a **hub**.

The other endpoints are called bridge **endpoints**.

The screenshot shows a web interface titled "VPN >> IPsec Bridging". It has two main sections. The first section, "IPsec Bridging", contains a checkbox labeled "IPsec Bridging" and a "Save" button. The second section, "Bridge End Point Setup", contains three dropdown menus: "From" (set to "Any"), "To" (set to "Any"), and "Through". There is also an "Add" button.

**IPSec Bridging**

Check the box to enable IPSec Bridging. If enable IPSec Bridging, then this machine is going to act as a hub. Upon enabling IPSec Bridging, you will be given options to select the pairs of tunnels for which bridging is to be setup. See example above.

**Bridge Endpoint Setup**

Configure a tunnel and two networks by selecting the **From** network, the **To** network, and the **Through** tunnel. If any packet has a specified source and destination network, the packet will be sent encrypted via the tunnel.

**Note:** Packets are sent via the tunnels only if the tunnels are up and running.

## VPN > PPTP

PPTP is a tunneling protocol meant for tunneling IP/non-IP packets through the Internet. It lets you grant single specified hosts access to your network via an encrypted tunnel. PPTP is considerably easier to set up than IPSec because, if Microsoft Windows is being used, it does not require additional software on the client computer as IPSec does. Also, PPTP is part of the Microsoft Windows program.

**Note:** When enabling PPTP for the first time, a random network for use as a Pool will be generated. Clients will be given addresses from this network range.

### Setting Up PPTP Users

You can define your own pool and set it to be used as the PPTP pool. Alternatively, you can assign a special IP to each user when you define each user's account (see **Networks & Services**).

- This IP does NOT need to be from the pool.
- The client does not request the IP address to be used. It is assigned to the client automatically.

If an application such as online banking is not working after implementing the RouteFinder, you can see if any packets were filtered out and which rule was responsible for filtering them.

The screenshot shows the 'VPN >> PPTP' configuration window. It is divided into two main sections: 'PPTP Settings' and 'User Authentication'.

**PPTP Settings:**

- PPTP Status:** A checkbox that is checked.
- Encryption Strength:** A dropdown menu set to '128'.
- Select Remote Address:** A dropdown menu set to 'Any'.
- Local Address:** A text field containing '0.0.0.1'.
- Remote Start Address:** A text field containing '0.0.0.2'.
- Remote End Address:** A text field containing '0.0.0.254'.
- Range:** A text field containing '253'.
- Save:** A button to save the settings.

**User Authentication:**

- Authentication Type:** A dropdown menu set to 'local'.
- Save:** A button to save the authentication settings.
- Username:** An empty text input field.
- Password:** An empty text input field.
- Static IP Address:** An empty text input field.
- Add:** A button to add a new user.
- Allowed Users:** A list box containing the text 'roadwarrior'.
- Delete:** A button to delete a user.

### PPTP Settings

#### PPTP Status

Check the **Status** checkbox to enable this PPTP function.

#### Encryption Strength

Select the encryption strength, either strong (128 Bit, the default, or weak (40 Bit) encryption. This field defines the encryption strength (40 bit or 128 bit) for the remote access connection.

#### Select Remote Address

If you use private IP addresses for your PPTP pool, such as the predefined network, you must create Masquerading or NAT rules for the PPTP pool in order for the PPTP clients to be able to access the Internet. Be sure the network is defined in the **Networks & Services > Networks**.

Select the Remote IP address for the PPTP link and click the **Save** button. Additional fields then display providing you the following information:

**Local Address** (local IP address of the server the remote clients will access)

**Remote Start Address** (the first IP address in a range of IP addresses to be assigned to remote clients)

**Remote End Address** (the last IP address in a range of IP addresses to be assigned to remote clients)

**Range** (the total number of IP addresses that can be assigned to remote clients; e.g., 253)

**User Authentication****Authentication Type**

Select the type of authentication to be used. Options are Local or RADIUS. Click the **Save** button.

**User Name and Password**

Enter the name (in lowercase) and password (in lowercase) of the PPTP user. Click the **Add** button.

**Allowed Users**

The names of the users entered above display in this text box. If you wish to delete a name, click the **Delete** button.

## Wizard Setup – Screen Description

Using the Wizard Setup screen is a quick way to configure your RouteFinder. The screen contains the basic configuration input fields for setting up the RouteFinder as a firewall. If you desire to configure your RouteFinder to meet your company's specific needs beyond what is cover in the Wizard, use the Web Management software.

The screenshot shows the Wizard Setup screen with the following sections:

- General Settings**
  - Administrator Mail Address:
  - Hostname:
- LAN Settings**
  - LAN IP Address:
  - Subnet Mask:
- WAN Settings**
  - WAN IP Address:
    - ☒ Static IP Address
    - ☐ PPPoE
    - ☐ DHCP Client
  - WAN IP Address:
  - Subnet Mask:
  - Gateway:
  - DNS IP Address:
- Modem Settings**
  - PPP dial backup: ☐
- Password Settings**
  - root Password:
  - Confirm root Password:
  - Webadmin Password:
  - Confirm Webadmin Password:
  - SSH admin Password:
  - Confirm SSH admin Password:
- Packet Filter rule**
  - ☒ LAN -- ANY -- ANY -- ACCEPT

Buttons: Save, Cancel

### General Settings

#### Administrator Mail Address

Enter the administrator's mail ID. Unlike the Administration > System Setup in the Web Management software which allows several entries, the screen allows only one ID.

#### Host Name

Enter the Host Name of your firewall. Example format: FIREWALL.mydomain.com

### LAN Settings

#### LAN IP Address and Subnet Mask

Enter the IP address and the mask for the LAN interface.

### WAN Settings

Select the method of assignment of the IP address and mask for WAN interface. Choose one of the following:

#### Static IP Address

Click the Static IP Address button. Enter the IP address and mask for WAN interface. You can enter the gateway and DNS server addresses also.

#### PPPoE

Click the PPPoE button. The corresponding entry fields will display. Enter the ADSL User Name and Password provided by the ISP for the PPPoE connection.

#### DHCP Client

When selected, no other fields display.

***Packet Filter Rule***

If this setting is enabled by checking the checkbox, all packets coming from the LAN will be forwarded by the firewall. If disabled, none of the packets will go through.

***Modem Settings***

Use this checkbox to enable/disable the modem PPP dial backup feature. If enabled, enter the User Name, Password, Serial Port, Baud Rate, Dial Number, and Initialization Strings for the backup port.

***Password Settings***

Use this section to change the password for the root user, WebAdmin User, and the SSH User (login user).

It is highly recommended that you change passwords.

***Save or Cancel***

When all of the parameters are set, click the **Save** button to activate them. Your RouteFinder is now configured.

## Statistics & Logs

Various log files maintained by the RouteFinder can be viewed and/or downloaded to the browser. This function provides current system information, status, and usage information. The information is valuable for troubleshooting and for monitoring the RouteFinder's operational status and overall performance.

The following functions can be accessed under **Statistics & Logs**:

- Uptime (length of continuous RouteFinder operation and the amount of time the system has been running continuously). Can view start up history.
- Hardware (CPU, RAM, and Swap utilization details)
- Networks (network interface details, routing table details, network connections)
- Interfaces (displays network traffic on each interface - LAN, WANLINK1 , WANLINK2)
- SMTP Proxy (displays SMTP log, SMTP number of messages, SMTP concurrency, and SMTP status)
- Accounting (displays interface-based accounting, IP-based accounting, VPN-based accounting)
- Self Monitor (self monitor live log)
- IPSec (IPSec live log and IPSec live log connections)
- PPTP (PPTP live log, live connections, history of calls)
- Packet Filters (displays defined filter rules, system-generated rules, and filter violations)
- Port scans (Intrusion detection live log, port scan detection live log)
- View Logs (displays a list of log files maintained by the RouteFinder)
- HTTP Access (generate and view HTTP Access Reports, Reject Reports)
- DHCP (DHCP subnet information)
- SMTP Virus Quarantine (displays virus-quarantined email)
- POP3 Virus Quarantine (displays virus-quarantined email)
- SMTP Spam Quarantine (using a Message Expression filter and an Attachment filter, SPAM emails will not be relayed and will be quarantined in the SPAM area. They can then be evaluated by the system administrator.
- Administrative Authentication Log (shows successful/failed login attempts and HTTPS administrative access logs)
- QoS (displays bandwidth utilization of WANLINK1, WANLINK2, LAN)
- DDNS Log (displays information about the updating of the domain name (IP address) and whether it succeeded or failed in the DDNS server).

The data in the logs could be useful to outside attackers, and it may well be considered confidential too. For security reasons, certain information should not be logged where an intruder could possibly access it.

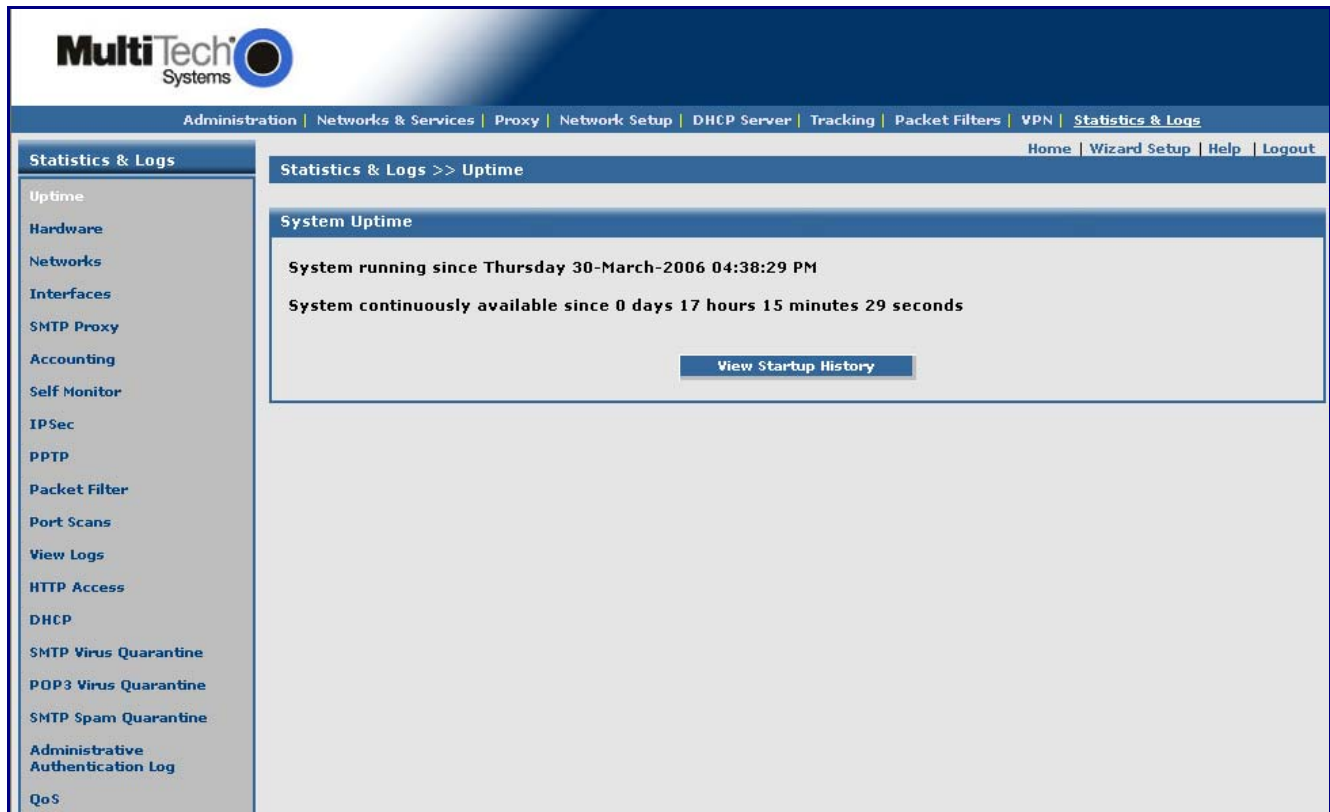
The logs help you watch for usual patterns of usage, newly-developing trends in usage, and to alert you to any and all exceptions to these patterns of typical use. Administrators should become very familiar with the typical log patterns and messages, so that it can be recognized when something goes wrong (i.e., an unusual pattern of usage develops).

Generally speaking, log data falls into one of three categories:

1. **Known to be OK** - These are messages that can typically be ignored:
2. System running since Monday 21 October-2002 02:30:44PM, or  
CNAME\_lookup\_failed\_temporarily\_(#4.4.3)/, or  
Watching superdaemon.pl ALL OK.
3. **Known to be problems** - Messages that should cause some action (email the administrator, start investigating the cause, etc.). For example: a message about a bad disk block at location 0x56c8a7 or something similar.
4. **Unknown** - Messages that someone should examine, such as why someone is sending UDP packets from port 20 to some arbitrary port above port 1024 (doesn't match any known protocol).

## ***Statistics & Logs > Uptime***

Uptime tells you how long the system has been running. The first line displays the date and time the system was started. The second line displays the total time elapsed since the system was started in days, hours, minutes, and seconds.



## ***Statistics and Logs > Hardware***

This screen displays a graphical presentation of the CPU, RAM, and SWAP utilization by days, weeks, months, and years.

**Hardware Details:** CPU, RAM, SWAP disk partitioning.

**CPU Statistics:** Displays the actual usage of the processor on the system (displays as a graph).

**RAM Statistics:** Displays the amount of RAM used by the various RouteFinder processes that are in execution.

**SWAP Statistics:** Shows the actual usage of the swap space on the system. When using the HTTP proxy is in use, frequent activity of the swap file is normal (displays as a graph).

The log files are updated every five minutes and displayed in the **Hardware** charts.

The graph shows daily, weekly, monthly, and yearly **CPU**, **RAM** and **SWAP** utilization statistics.

## ***Statistics and Logs > Networks***

This option displays an analysis of the RouteFinder's network interface details, routing, and network connections.

### ***Network Interface Cards***

Click the **Interface Details** button to display the details about all the interfaces (eth0, eth1, eth2, lo (local)).

### ***Routing Table***

Click **Routing Table** to display the Kernel IP routing table of all entered routes. The information includes Destination, Gateway, Genmask, Flags, Metric, Ref(Reference), and Use, Iface (User Interface).

**Important Note:** Interface routes are inserted by the system and cannot be edited. Additional routes can be added in **Network Setup > Routes**. This is an example of the Statistics & Logs Routing Table report.



**Network Connections**

Click the **Network Connections** button to display the status of all current (active) network connections to or from your RouteFinder. It also shows you all of the established TCP sessions and all of the TCP and UDP ports that the RouteFinder is listening to for incoming connections. (Connections through the RouteFinder are not shown).

**TCP and UDP Connections Example**

Active Internet connections (w/o servers)						
Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State	PID/Program name
tcp	0	0	127.0.0.1:33281	127.0.0.1:33282	ESTABLISHED	1907/perl
tcp	0	0	127.0.0.1:33284	127.0.0.1:33283	ESTABLISHED	1905/(squid)
tcp	0	0	127.0.0.1:33279	127.0.0.1:33280	ESTABLISHED	1906/perl

**Proto**

Protocol - TCP or UDP (RAW sockets are not supported).

**Recv-Q**

Receive Queue - An entry here means that the IP stack had received data at the moment you requested the output.

**Send-Q**

Send Queue - An entry here means that the IP stack sent data at the moment you requested output.

**Local Address**

Shows the local (Servers) IP address and the port separated by a colon (:). If you find here, for example, **192.168.2.43:443**, you know that there is an active HTTPS session.

**Foreign Address**

The destination IP address and port (for example **192.168.2.40:1034**).

**State**

Status of the connection – Sets of possible states reported are, for example: LISTEN, ESTABLISHED. TIME\_WAIT.

**PID/Program Name**

Process ID (PID) and process name of the process that has the socket open.

**UNIX Connections Example**

Active UNIX domain sockets (w/o servers)							
Proto	RefCnt	Flags	Type	State	I-Node	PID/Program name	Path
unix	3	[ ]	STREAM	CONNECTED	8476796	390/sockd	
unix	3	[ ]	STREAM	CONNECTED	8476795	383/sockd	
unix	3	[ ]	STREAM	CONNECTED	8476793	389/sockd	

**Proto**

Protocol: UNIX

**RefCnt**

Reference Count – Attached processes via this socket.

**Flags**

Flags Displayed – Flags displayed are SO\_ACCEPTON (displayed as ACC), SO\_WAITDATA (W), or SO\_NOSPACE (N). SO\_ACCEPTON is used on unconnected sockets if their corresponding processes are waiting for a connect request. The other flags are not of normal interest.

**Type**

Shows types of socket access:

SOCK\_DGRAM – The socket is used in Datagram (connectionless) mode.

SOCK\_STREAM – This is a stream (connection) socket.

SOCK\_RAW – The socket is used as a raw socket.

SOCK\_RDM – This one serves reliably-delivered messages.

SOCK\_SEQPACKET – This is a sequential packet socket.

SOCK\_PACKET – Raw interface access socket.

UNKNOWN

**State**

This field contains one of the following keywords:

FREE – The socket is not allocated.

LISTENING – The socket is listening for a connection request. Such sockets are only included in the output if you specify **-l** or **-a** option.

CONNECTING – The socket is about to establish a connection.

CONNECTED – The socket is connected.

DISCONNECTING – The socket is disconnecting.

(empty) – The socket is not connected to another one.

**PID/Program Name**

Process ID (PID) and process name of the process that has the socket open.

## Statistics & Logs > Interfaces

The information displayed under each option shows the network traffic on each interface (LAN, WAN, DMZ) delineated by days, weeks, months, and years. Interfaces must be added on the **Tracking > Accounting** screen.

### Network Traffic Overview - LAN – WAN – DMZ

Click the **LAN Traffic** button for a graphical overview of network traffic on the LAN interface.

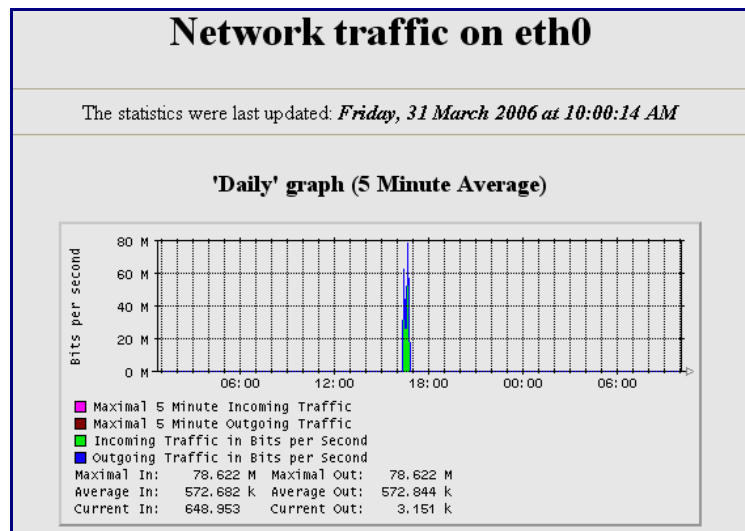
Click the **WAN Traffic** button for a graphical overview of network traffic on the WAN interface.

Click the **DMZ Traffic** button for a graphical overview of network traffic on the DMZ interface.

### Network Traffic Overview - LAN – WANLINK1 – WANLINK2

#### Example

Statistics are shown for daily, weekly, monthly, and yearly traffic. This example shows the daily graph for LAN traffic.



## Statistics & Logs > SMTP Proxy

The **SMTP Proxy** screen displays the RouteFinder's SMTP proxy (email) usage and status in two windows called SMTP-Logs and SMTP-Status. It shows a real-time log of the email traffic via the SMTP proxy. The real-time log function is started by clicking the open SMTP Log button.

### SMTP Log

Click the **SMTP Log** button to display real-time statistics of the SMTP proxy activities.

### SMTP Message

Click the **SMTP Message** button to display a graph showing the number of messages in the queue waiting to be processed and the number of messages which are processed, separated by days, weeks, months, and years.

### SMTP Concurrency

Click the **SMTP Concurrency** button to display the number of SMTP connections already established and the incoming and outgoing traffic in bytes per second, separated by days, weeks, months, and years. Shown as a graph.

### SMTP Status

The SMTP Status displays the number of emails in the queue and the number of emails waiting to be processed.

## Statistics & Logs > Accounting

This report gives the details of the amount of data transferred in bytes through the system on every interface (LAN, WAN, DMZ). The Accounting function records all the IP packets on the external network cards and sums up their sizes. Each day's total is calculated once a day. Additionally, the number of bytes of data is calculated for each month.

The displayed traffic will match what your ISP charges if your service is volume-based.

**Important:** You define which interfaces and networks are included on this screen in the **Tracking > Accounting** menu.

### Interface Based Accounting

Display accounting information for all the interfaces. Interfaces must be added on the **Tracking > Accounting** screen.

### IP Based Accounting

Displays a graph of traffic from/to the selected IP address.

**Note:** If there are no entries in the drop down list box, you can add them on the **Tracking > Accounting** screen in the IP-Based Accounting section.

### VPN Based Accounting

Displays the accounting information for all the IPSec tunnels that are currently enabled.

## Statistics & Logs > Self Monitor

The Self Monitoring function ensures the integrity of the RouteFinder system and informs the administrator of important events by email. Self Monitoring controls the function, performance, and security of the system parameters and takes regulating measures when it detects divergences that go beyond a certain tolerance. The system administrator then receives a report via email.

Self Monitoring considerably reduces maintenance, as manual intervention becomes almost obsolete, resulting in less work for the administrator.

The RouteFinder's Self Monitoring function ensures that the central services (e.g., the RouteFinder MiddleWare daemon, the Syslog daemon, the HTTP proxy, or the network accounting daemon) function smoothly. The access rights to files are controlled, as is the individual process' share of consumption of the system resources. This prevents any possible RouteFinder overload. The administrator is also notified of any possible future resource shortage, such as a hard disk running low on space.

If no entries are displayed your RouteFinder is stable.

Click the **Self Monitor Live Log** button to open the report, which provides a record of the processes that have been restarted due to possible abnormal termination.

### Example of a Self Monitor Live Log Report

Self Monitor Live Log	
Wed Aug 4 16:25:01 CDT 2004	: postmaster okay
Wed Aug 4 16:25:01 CDT 2004	: syslog-ng okay
Wed Aug 4 16:30:01 CDT 2004	: dhcpd okay
Wed Aug 4 16:30:01 CDT 2004	: snmpd okay
Wed Aug 4 16:30:01 CDT 2004	: crond okay
Wed Aug 4 16:30:01 CDT 2004	: httpd okay
Wed Aug 4 16:30:01 CDT 2004	: named okay
Wed Aug 4 16:30:01 CDT 2004	: postmaster okay
Wed Aug 4 16:30:01 CDT 2004	: syslog-ng okay
Wed Aug 4 16:35:01 CDT 2004	: dhcpd okay
Wed Aug 4 16:35:01 CDT 2004	: snmpd okay
Wed Aug 4 16:35:01 CDT 2004	: crond okay
Wed Aug 4 16:35:01 CDT 2004	: httpd okay
Wed Aug 4 16:35:01 CDT 2004	: named okay
Wed Aug 4 16:35:01 CDT 2004	: postmaster okay
Wed Aug 4 16:35:01 CDT 2004	: syslog-ng okay
Wed Aug 4 16:40:01 CDT 2004	: dhcpd okay

## ***Statistics & Logs > IPSec***

### ***IPSec Live Log***

Click the **IPSec Live Log** button to display information about initialization, encryption/decryption messages, route manipulation, IPSec/IKE interaction, and IKE processing messages.

### ***IPSec Live Connections***

Click the **IPSec Live Connections** button to display real-time VPN statistics about active VPN routes and connections. It includes connection name, connect time, local gateway, remote gateway, security policy, tunnel end-point and important processes or error messages.

## ***Statistics & Logs > PPTP***

In the **PPTP LiveLog** you can view important processes or error messages. The logs provide you with the best chance of detecting attacks against your site, as well as for finding out the results of a successful attack. You will probably want to keep log information in a location separate from the RouteFinder, to keep an intruder from destroying the log data upon compromising the RouteFinder.

### ***PPTP Live Log***

Click **PPTP Live Log** button to display all the important information about PPTP logins (successful as well as failed), the encryption strength (128 or 40 bit), the mode of authentication (CHAP, MSCHAP, or MSCHAPv2), and user name.

### ***PPTP Live Connections***

Click the **PPTP Live Connections** button to display information about users who are logged into the server at any given point in time. This screen also displays information about the links on which the users are connected and the local and remote IP addresses of the links. It shows user name, connect date and time, and bytes received and sent.

### ***History of Calls***

The **PPTP History of Calls** displays information about users who have connected so far. It shows connect date and time, user name, interface on which the user is connected, original IP address of the user, and total traffic transmitted and received.

## ***Statistics & Logs > Packet Filter***

This report shows the RouteFinder firewall logs for various types of packets. The type and number of packets to be displayed can be configured. You can also select the refresh rate of the log display.

In the **Packet Filter > Packet Filter Rules** page, if there is any user-defined filter with Action as LOG, the packets matching the corresponding source address and service will be logged.

Statistics & Logs >> Packet Filter	
<b>Show Logs</b>	
Permitted Inbound Access Logs	<input type="checkbox"/>
Permitted Outbound Access Logs	<input type="checkbox"/>
All Access Requests Traversing Firewall Violating Security Policy	<input type="checkbox"/>
All Access Requests To Firewall Violating Security Policy	<input type="checkbox"/>
Log Access to Admin Port	<input type="checkbox"/>
User Defined Packet Filter Logs	<input type="checkbox"/>
Fragmented Packets(Dropped)	<input type="checkbox"/>
Auto Refresh (30 sec)	<input type="checkbox"/>
Select Number of Lines to Display	All <input type="button" value="View"/>
Search Pattern Within Results	<input type="text"/> <input type="button" value="Search"/>
<b>View All Logs</b>	
View All Log Messages	<input type="button" value="View All"/>
<b>Backup Logs</b>	
Download Log	2006-03-27.zip <input type="button" value="Download"/>
Delete Log	<input type="button" value="Delete"/>

### ***Show Logs***

Select the packets to be displayed by checking the box next to the packet category.

Check *Auto Refresh* if you like the screen to refresh every 30 seconds.

Select the number of lines from the log database to display on the screen.

Enter the *Search Pattern Within Results* – Enter the text pattern for which the system will search.

Click the **View** button to display the log file.

### ***View All Logs***

Select this option to view all logs listed above.

### ***Backup Logs***

Use this section of the screen to backup your log files or to delete the current log files.

## ***Statistics & Logs > Port Scans***

The Port Scans screen displays the information gathered by the Network Intrusion Detection module, which guarantees the integrity of the system by watching and logging stealth port scans and suspicious packets. The system administrator will receive emails every hour if such packets are received.

You can setup User Defined Intrusion Detection rules on the **Administration > Intrusion Detection** screen.

**Note:** Apart from the use defined rules, the intrusion detection module will log port scans detected, but the destination address and port will not be displayed for these packets. Instead, the number of port scan attempts will be displayed.

### ***Intrusion Detection Live Log***

Click the **Intrusion Detection Live Log** button to display the **User Defined Intrusion Detection** rules entered on the **Administration > Intrusion Detection** screen.

### ***Portscan Live Log***

Click the **Portscan Live Log** button to display detected port scans. The source address, the destination address, protocol, source port, and destination port of these packets will be displayed.

## ***Statistics & Logs > View Logs***

Various log files maintained by the RouteFinder can be viewed and downloaded to the browser from this screen. The other log file screens provide real-time view. This screen provides you with access to log files from previous dates. Logs available for viewing are Kernel Log, Daemon Log, HTTP Proxy Access, Network Intrusion Alert, IPSec, Self Monitor, URL Filtering, Mail Reply, PPP, PPTP, PPPoE, and SPAM Log.

### ***Select a Date and Select a Log File***

1. First, select the date of the log file, and then select the type of log file.
2. Click the Continue button.
3. Another screen displays. On this screen, select the time and action to be taken. Actions may be:
  - Display the file
  - Search for a pattern in the file
  - Download the file
4. Click **Go**.

## *Statistics & Logs > HTTP Access*

HTTP Access reports provide a clear picture of “where” your users are going to on the Internet.

The screenshot shows a web interface titled "Statistics & Logs >> HTTP Access". It contains four main sections, each with a button:

- Generate HTTP Access Reports**: A button labeled "Generate HTTP Access Reports".
- Generate HTTP Reject Reports**: A button labeled "Generate HTTP Reject Reports".
- View HTTP Access Reports**: A button labeled "View HTTP Access Reports".
- View HTTP Reject Reports**: A button labeled "View HTTP Reject Reports".

### *Generate HTTP Access Reports*

From this screen you can generate and view HTTP Access and Reject Reports

When you click the **Generate the HTTP Access Reports** button, the following screen displays. A similar screen for reject reports displays when you click the corresponding button.

The screenshot shows a web interface titled "Statistics & Logs >> HTTP Access". It contains two main sections:

- Generate HTTP Access Report From Firewall/VPN**: A section with a text input field labeled "HTTP Access Report From Firewall/VPN" and a "Generate" button.
- Import and Generate HTTP Access Report From Remote Client**: A section with a "Select a file" label, a text input field, a "Browse..." button, and "Generate" and "Cancel" buttons.

### *Generate HTTP Reject Reports*

1. Click the **Generate** button to generate the current day's HTTP Reject report.
2. Select a file from the remote client server by browsing to the file name and then clicking the **Generate** button. This will generate the HTTP Reject Report from the Remote Client.

### *View HTTP Access Reports*

The report shows where users are going on the Internet. It includes the following information: Users, IP Address, bytes, sites, and times. You must enable **Status** and **Transparent** at **Proxy > HTTP Proxy**.

### *View HTTP Reject Reports*

The report provides IP addresses / user names of the users who have tried to access denied sites. You must configure **Proxy > HTTP Proxy > URL Categorization** in order to view this report.



[Statistics & Logs > DHCP](#)  
[Statistics & Logs > SMTP & POP3 Virus Quarantines](#)  
[Statistics & Logs > SMTP SPAM Quarantines](#)  
[Statistics & Logs > Administrative Authentication Log](#)

## ***Statistics & Logs > DHCP***

This live Log gives information about the DHCP leases that have been provided so far. Click the **DHCP Live Log** button to view this log.

DHCP Subnet Information								
Location	Subnet	Netmask	IP range	IP subranges defined	Router	IPs defined	IPs used	IPs free
	192.168.2.0	255.255.255.0	192.168.2.1 - 192.168.2.254	192.168.2.2-192.168.2.254	192.168.2.1	253	1	252

*Example of a DHCP Log*

## ***Statistics & Logs > SMTP Virus Quarantines***

If the Virus Scanner is enabled, and if the SMTP proxy captures any virus infected emails, the emails will be saved in the virus quarantine area. These emails can be viewed by the administrator who can then take action as to whether or not to delete or forward the emails to the email ID.

## ***Statistics & Logs > POP3 Virus Quarantines***

If the Virus Scanner is enabled, and if the POP3 proxy captures any virus infected emails, the emails will be saved in the virus quarantine area. These emails can be viewed by the administrator who can then take action as to whether or not to delete or forward the emails to the email ID.

## ***Statistics & Logs > SMTP SPAM Quarantines***

If *Message Expression* filter or *Attachment Filtering* is enabled in **Proxy > SPAM Filtering**, and if such emails are to be relayed by the firewall, these emails will not be relayed and they will be saved in the SPAM quarantine area.

These emails can be viewed by the administrator who can then take action as to whether or not to delete or forward the emails to the email ID.

## ***Statistics & Logs > Administrative Authentication Log***

Statistics & Logs >> Administrative Authentication Log

Administrative Authentication Log

Show Successful Log ☐

Show Failed Log ☐

Administrative Authentication Log

HTTPS Administrative Access Log

HTTPS Administrative Access Log

### ***Administrative Authentication Log***

Shows the successful and/or failed login attempts at the RouteFinder's Administrative Access interface. This log view is enabled on the **Administration > Administrative Access** screen.

### ***HTTP Administrative Authentication Log***

Shows all traffic that is directed at the RouteFinder's currently configured administrative HTTP access port. This log view is enabled on the **Administration > Administrative Access** screen.

## ***Statistics & Logs > QoS***

This screen will display the bandwidth utilization WAN, DMZ, and LAN when Load Balancing is disabled. When Load Balancing is enabled, Bandwidth Utilization displays for WANLINK1, WANLINK2, and LAN.

The graphs display daily, weekly, monthly, and yearly bandwidth utilization.



## ***Statistics & Logs > DDNS Log***

This screen provides information about the updating of the domain name or IP Address. It lets you know whether the process succeeded or failed on the DDNS Server.

# Chapter 7 – User Authentication Methods

While you can restrict access of your internal clients to proxy services at the IP level by using packet filter rules, you will run into problems when you use a dynamic IP configuration protocol like DHCP or BOOTP internally. That's where Proxy User Authentication steps in. Here, clients must authenticate themselves to the proxy service with a username and password, making it possible to limit access by-person instead of by-IP address. In addition, it will also be possible to do "per-user" accounting, for example, in the HTTP proxy access logs.

## ***Proxy Services and Authentication Methods***

The RouteFinder currently includes two proxy applications: SOCKS5 and HTTP. Both of these proxies can be configured to accept all clients (access control based on IP addresses) or only clients providing a valid username and password (User Authentication). If you select to use User Authentication for either of these proxy services, you must select a method for the RouteFinder to validate the supplied credentials. The RouteFinder currently supports User Authentication against:

- A RADIUS server configured in Administration > User Authentication > Radius & SAM
- An NT SAM User Base configured in Administration > User Authentication > Radius & SAM
- Users defined in Administration > User Authentication > Local

### ***RADIUS User Authentication***

With this method, ASL will forward User Information to a RADIUS server. RADIUS is a protocol typically used to authenticate and account Dialup Users for Remote Access. However, the protocol is very flexible and RADIUS servers are available for almost every operating system.

The RouteFinder's implementation of the RADIUS method allows you to configure access rights on both a per-proxy and a per-user basis.

### ***NT SAM (SMB) User Authentication***

This method uses a Microsoft Windows NT/2000 domain controller to validate user accounts. Many companies already run NT/2000 networks based on Microsoft NT or Windows 2000 Active Directory Domain concepts. The advantage of this method is that it is very easy to set up if you already run a PDC (Primary Domain Controller) on your network. The disadvantage is that only a "flat" authentication model is supported, meaning that either ALL or NONE of the existing users in the NT Domain will be allowed to use a proxy service (meaning that you cannot differentiate between User A and User B).

### ***Local RouteFinder User Authentication***

This method does not need an external server to validate user accounts. You can add users with the RouteFinder's Web front end and specify the allowed proxy types on a "per-user" basis.

## ***Which Method Should You Choose?***

This section provides possible scenarios that can help you decide which method of user authentication is the right one for your implementation of the RouteFinder.

### ***Scenario 1: "Just a couple of Windows boxes"***

You are running a small peer-to-peer network without a domain controller or other centralized authentication. This will typically be a SOHO or "family home" network.

You should use "Local" ASL user authentication.

### ***Scenario 2: "Microsoft-style Windows Network with all valid users able to use proxy services"***

You are running a Windows Domain controller or a standalone server on your network, holding User Accounts. Typically, this is also the case if you are running MS Exchange on your network and you want every valid user to be able to use the proxy services.

You should use NT SAM (SMB) user authentication.

**Scenario 3: "Microsoft-style Windows Network - not all valid users able to use proxy services"**

You are running a Windows Domain controller or a standalone server on your network holding User Accounts. Typically, this is also the case if you are running MS Exchange on your network, but not all of your users should be able to use proxy services.

You should use RADIUS user authentication with Microsoft's IAS (Internet Authentication Server).

**Scenario 4: "Unix or Netware Network"**

You are running any other type of Network with a centralized user base.

In this case, you can use RADIUS user authentication; however, it is up to you to find a suitable RADIUS server for your network type.

You can also use the "Local" user authentication, but you must re-define all your users in the RouteFinder Web Front end.

**Note:** Many mixed scenarios are also possible. For example, you could have some local users being able to use the SOCKS service, plus a RADIUS server authenticating users for the HTTP proxy service.

## Authentication Setup

Choose one of the following setup methods.

### *Setting Up RADIUS Authentication*

To set up RADIUS Authentication, first you need a RADIUS server on your network. The server can be anywhere on the Internet, but keep in mind that passwords are transferred in clear text. Therefore, we strongly recommend putting the RADIUS server somewhere near your RouteFinder and to use a switched Network hub to connect them.

Choosing the RADIUS server is up to you. Below is some generic setup information.

The RouteFinder will send a RADIUS authentication packet with three fields:

1. Username
2. Password in plain text (PAP)
3. The proxy type ("http" or "socks") in the NAS-Identifier field based on these values, your RADIUS server should just decide to grant or deny access.

### *Setting Up a Microsoft IAS RADIUS Server*

This section explains how to set up a Microsoft IAS (Internet Authentication Server). IAS is delivered with all Windows 2000 Server versions. However, it is often not installed by default.

1. Check if the IAS service is installed. If not, follow the rest of these steps.
2. Using 2000 **User Manager**, edit User Profiles of those users who have rights to proxy services. Set the "Dial-In Permission" flag. This is necessary since IAS uses the "master flag" to respond to requests positively.
3. Create a new user group for each proxy service you wish to provide to your users. For clarity, give the groups descriptive names (for example, call the group "multitech\_http\_users").
4. Put the users in the newly created groups for using the respective proxy services.
5. Enter the IAS administration interface at **Start > Programs > Administrative Tools > Internet Authentication Service** and add a new client using these settings:
  - Friendly Name: routefinder
  - Protocol: RADIUS
  - Client Address: Use the address of the RouteFinder's interface pointing "towards" the RADIUS server (this will be the "internal" interface for most people).
  - Client Vendor: RADIUS Standard. Uncheck the Client must always send signature attribute box.
  - Select a shared secret. This is needed for the RouteFinder configuration.
6. Go to the policy list. There is one pre-defined entry. Delete it. Add a new Policy for each proxy service you wish to provide to your users. Choose a "Friendly Name" (i.e.; "SOCKS access").
7. On the next screen, add two conditions:
  - NAS-Identifier matches <string> (where <string> is the proxy identifier ("socks" or "http").
  - **Windows-Groups matches <yourgroup>** (where <yourgroup> is one of the newly created user groups).

**Note:** You can add groups from the local machine or from Domains in which the RADIUS server is a member. Specify the user name as <DOMAIN>\<USER> for authentication to succeed, if required.

8. Choose Grant Remote Access Permission in the next screen.
9. Edit the profile on the next screen. Select the Authentication Tab. Check Unencrypted Authentication (PAP).
10. Click OK and Finish. Remember you need one policy for each proxy service.
11. Configure the RADIUS authentication method on the RouteFinder (use the IP of the IAS server and the shared secret). Use the RADIUS authentication method settings in User Authentication > RADIUS & SAM.
12. Check the System Log in the NT/2000 Event Viewer; that's where NT/2000 puts information about RADIUS authentication requests.

## ***Setting Up NT/2000 SAM (SMB) Authentication***

To setup Windows NT/2000 SAM Authentication, you will need an NT/2000 machine on your network that holds the user accounts. This can be a domain controller (PDC) or a simple standalone server. The server has a NETBIOS name (the NT/2000 server name) and an IP address.

Put these values in the configuration of the NT SAM method in **User Authentication > RADIUS & SAM** as PDC Name and PDC address. If you have a Backup domain controller, also enter its corresponding values in **User Authentication > RADIUS & SAM**.

Finally, you need the default domain to authenticate against. This will be overridden if users specify their user name as <DOMAIN>\<USERNAME>. Otherwise, it will be filled in as the <DOMAIN> part.

**Caution:** Disable the **Guest** account of your NT domain, since this one will allow **Any** username/password combination to pass!

## Chapter 8 – Frequently Asked Questions (FAQs)

**Q1. Where is the RouteFinder installed on the network?**

**A1.** In a typical environment, the RouteFinder is installed between the internal network and an external network. Refer to Chapter 1 and 2 of this manual for more information.

**Q2. If DMZ is used, does the exposed user share the public IP with the Router?**

**A2.** Yes.

**Q3. What about RouteFinder firewall security support?**

**A3.** As small businesses shift from dial-up to always-on broadband Internet connections or leased line connections, their networks become more vulnerable to Internet hackers. The RouteFinder uses Stateful Packet Inspection technology and the NAT protocol to provide security from hackers attempting to access the office LAN. An automatic update feature provides the highest level of security by automatically downloading any new system updates protecting against newly discovered hacker threats. Additionally, the RouteFinder uses proxies to filter Internet content protecting against dangerous ActiveX controls or Javascript and unwanted Web content.

**Q4. Is Virtual Server support provided on my RouteFinder?**

**A4.** Yes, in addition to providing shared Internet access, the RouteFinder can support a Web, FTP, or other Internet servers. Once configured, the RouteFinder only accepts unsolicited IP packets addressed to the web or ftp server. Refer to Chapter 3.

**Q5. Is it possible to define a static NAT from the outside to the inside, (e.g., Map external IP a.b.c.d to internal IP w.x.y.z) in both directions?**

**A5.** Yes, it is possible to do static NAT, but with limitations:

You can map:	You <u>cannot</u> map:
IP/Port => IP/Port	IP => IP
IP/Port-Range => IP/Port	IP-Range => IP
IP-Range/Port => IP/Port	IP => IP-Range (load balancing)
IP-Range/Port-Range => IP/Port	

The way back is done automatically.

NAT is done before the packets pass the packet filter, so you also have to make a rule allowing these IP-Packets to pass. There are 4 dropdown boxes in **Network Setup > SNAT**. The first two define which IP-Packets will be translated. The second two define into which IP/Port address they are translated.

**Example:**

Net1: 212.5.63.4/255.255.255.255 (Box1)  
 Srv1: 0:65535 TCP 80 (Box2)  
 Net2: 192.168.100.2/255.255.255.255 (Box3)  
 Srv2: 0:65535 TCP 81 (Box4)

**Explanation:**

If an IP-Packet from a.b.c.d port 34232 is sent to 212.5.63.4 port 80 (www) [a.b.c.d:34232 -> 212.5.63.4:80] and it reaches the RouteFinder, the destination information will be translated into [a.b.c.d:34232 -> 192.168.100.2:81]. If NAT is done before reaching the packet filter, you have to set the packet filter rules correctly.

**Q6. Is it possible to have multiple IPs assigned to the external interface, and then have multiple internal Web-servers?**

**A6.** Yes that is possible. You have to be sure that the request reaches the RouteFinder, and then you can use DNAT to redirect them to the Web servers. You don't need to bind those IP addresses to the external interface, as long as they are routed to the RouteFinder. The problem is that the IP packets have to reach the interface. There are 2 ways to accomplish this:

1. Bind an alias IP to the external interface, so that it answers ARP requests for this IP and the IP packets are sent to the ARP Address of this NIC card.

(If you're ready to do some hand typing on the console you can make an IP alias on your NIC and make a script in /etc/rc.d/rc2.d to have it run at each boot (put it at S99 to be sure). Just don't use **ifconfig** to do that, as it is deprecated in 2.4 kernels.

The command to add the IP 10.0.0.3 on your **eth0** NIC card is:

**IP addr add 10.0.0.3/24 broadcast 10.0.0.255 label eth0:0 dev eth0**

Note that the label part is not mandatory; it's just there so that ifconfig can list your alias. Moreover, the label name is free (you can have 'myalias' instead of eth0:0) though you should avoid characters like '-' or '\_' : ifconfig seems to get lost if you use these.)

2. Tell the RouteFinder to send those IP packets directly to the external interface by adding a static routing entry. You have to do subnetting; for example, enter the following interface definitions and routes:

Old:	New:
RouteFinder:	RouteFinder:
Router Ethernet Interface:	Router Ethernet Interface:
IP: 196.126.228.65	IP: 196.126.228.65
Netmask: 255.255.255.224	Netmask: 255.255.255.252
Routes: none	Routes:
Firewall:	196.126.228.67/255.255.255.252 ->
RouteFinder Ethernet	196.126.228.66
Interface:	196.126.228.72/255.255.255.248 ->
IP: 196.126.228.66	196.126.228.66
Netmask: 255.255.255.224	196.126.228.80/255.255.255.240 ->
Def GW: 196.126.228.65	196.126.228.66
	RouteFinder Ethernet Interface:
	IP: 196.126.228.66
	Netmask: 255.255.255.252
	Def GW: 196.126.228.65

**Q7. Can I forward SSH connections?**

**A7.** Yes, by configuring port forwarding of SSH (dest. port 22):

Source: External Interface Port 22 goes to

Destination: SSH\_Server Port 22

Procedure:

1. Define two Hosts in **Networks & Services**:

external\_NIC a.b.c.d 255.255.255.255

SSH\_Server e.f.g.h 255.255.255.255

2. Define one Service in **Networks & Services**:

NAT\_SSH TCP 0:65534 22

3. Add one NAT-Rule in **Network Setup > DNAT**: external\_NIC NAT\_SSH -> SSH\_Server NAT\_SSH.

4. Add one Rule in **Packet Filters > Packet Filter Rules**: Any NAT\_SSH SSH\_Server Allow.

This way, the destination address of every TCP packet will be translated from a.b.c.d:22 (Firewall) to e.f.g.h:22 (SSH-Server) and back again.



**Q8. How do I set up RouteFinder Masquerading?****A8.** Configure Masquerading in WebAdmin:

1. Define Interfaces in **Network Setup > Interface**. Here you define your Network Interface settings as well as your default gateway, for example:  
LAN Internal: 192.168.100.1/255.255.255.255  
WAN External: 194.162.134.10/255.255.255.128  
Gateway: 194.162.134.1/255.255.255.128
2. Define Network definitions in **Networks & Services > Networks**. Here you define your host and network definitions, which you will use for further configuration like Masquerading or Packet Filter Rules later on (i.e., Internal-Network 192.168.100.0 255.255.255.0 / Peters-Laptop 192.168.100.12 255.255.255.255).
3. Define Masquerading in **Network Setup > Masquerading**. Here you define which network should be masqueraded on which network interface (i.e., **Internal-Network > External**).
4. Define Packet filter Rules and Proxy Settings. Now you have set your Security Policy in terms of what is allowed and what is not allowed. The RouteFinder uses stateful inspection, so you only have to define which services are allowed; the way back is opened automatically (e.g., **Internal-Network - FTP - Any - Accept | Peters-Laptop - Telnet - Any - Accept**). If you want to use the Proxies you can configure them in **Proxy**.

**Q9. Can I do DNAT with Port ranges?****A9.** Yes. Mapping DNAT port ranges is supported, with the limitation that you can only map the same range (so, for example, you can map ports 500-600 to 500-600 but not 500-600 to 300-400).**Q10. Does NAT take place before or after routing and filtering take place?****A10.** In short, DNAT is done before the packets pass the packet filter, and SNAT and Masquerading are done after that. The RouteFinder uses a 2.4 kernel and IP tables (the internal logic in the netfilter code).**Q11. What are the current Certificate export laws?****A11.** New US encryption export regulations took effect on January 14th, 2000. At the time of this publication, CAs may export certificates to any non-government entity and to any commercial government-owned entity (except those that produce munitions), in any country except Afghanistan (Taliban-controlled areas), Cuba, Iran, Iraq, Libya, North Korea, Serbia (except Kosovo), Sudan and Syria.  
For the latest information on United States cryptography export and import laws, contact the Bureau of Export Administration (BXA) (<http://www.bxa.doc.gov/>).**Q12. Why is the export of cryptography controlled?****A12.** Cryptography is export-controlled for several reasons. Strong cryptography can be used for criminal purposes or even as a weapon of war. In wartime, the ability to intercept and decipher enemy communications is crucial. Therefore, cryptographic technologies are subject to export controls. U.S. government agencies consider strong encryption to be systems that use key sizes over 512 bits or symmetric algorithms (such as triple-DES) with key sizes over 56 bits. Since government encryption policy is influenced by the agencies responsible for gathering domestic and international intelligence (e.g., the FBI and NSA), the government tries to balance the conflicting requirements of making strong cryptography available for commercial purposes while still making it possible for those agencies to break the codes, if need be.**Q13. Can digital signature applications be exported from the U. S.?****A13.** Digital signature applications are one of the nine special categories of cryptography that automatically fall under the more relaxed Commerce regulations; digital signature implementations using RSA key sizes in excess of 512 bits were exportable even before the year 2000. However, there were some restrictions in developing a digital signature application using a reversible algorithm (that is, the signing operation is sort of the reverse operation for encryption), such as RSA. In this case, the application should sign a hash of the message, not the message itself. Otherwise, the message had to be transmitted with the signature appended. If the message was not transmitted with the signature, the NSA considered this quasi-encryption and the State controls would apply.**Q14. Can DES be exported from the U.S. to other countries?****A14.** For years, the government rarely approved the export of DES for use outside of the financial sector or by foreign subsidiaries of U.S. companies. Several years ago, export policy was changed to allow the unrestricted export of DES to companies that demonstrate plans to implement key recovery systems in a few years. Today, Triple-DES is exportable under the regulations described above.



**Q15. I want to use DNAT with multiple original IPs, but my external NIC has just one IP. How can I do this?**

- A15.** Make sure that the request reaches the RouteFinder, and then use DNAT to redirect the request to the Web servers. There are two ways to do this:
1. Bind an alias to the external interface, so that it answers ARP requests for this address and the packets are sent to the MAC address of this NIC. You can do this in **Network Setup > Interface** (refer to Chapter 3).
  2. Tell your router to send those packets directly to the RouteFinder's interface by adding a static routing entry to the RouteFinder.

**Q16. My FTP clients want to use FXP transfers on my Server. How can I do that?**

- A16.** For a fully functional FTP server (able to do FXP), the RouteFinder's "stateful inspection" function is not enough. Due to security concerns, the RouteFinder will only allow data connections from and to the same client IP as the control connection.

The example below shows how to make a "glftpd" server work behind a RouteFinder, which does both packet filtering and DNAT. The general principle applies to all other FTP servers too, so you can use it even if you use another server daemon.

Let's assume that you have **glftpd** set up in your LAN on address 192.168.1.10 with control port 23456. Your external, official IP on the RouteFinder is 1.2.3.4.

Go to **Networks & Services > Networks** and define the host entries for FTP server and external RouteFinder interface:

**FTP\_Server 192.168.1.10 255.255.255.255**

**ASL\_Extern 1.2.3.4 255.255.255.255**

Go to **Networks & Services > Services** and define entries for the control connection and the passive mode port range that the RouteFinder will use.

**FTP\_ALTControl TCP 1024:65535 23456**

**PASV\_Range TCP 1024:65535 3000:4000**

Note that we selected the ports from 3000-4000 to be our passive connection range in this example. You should select a range matching your setup, do not make it too small, and make sure you do not need any ports in this range for other services.

Go to **Packet Filters > Packet Filter Rules** and add the following rules:

**Any FTP\_ALTControl FTP\_Server Allow**

This rule allows connections of clients to the FTP server.

**FTP\_Server Any Any Allow**

This rule allows the FTP server to make outgoing connections to clients, thus enabling the PORT command.

**Any PASV\_Range FTP\_Server Allow**

This rule allows connections from clients to the passive port range of the FTP server (needed to make passive mode work).

Add the DNAT rules. Go to **Network Setup > DNAT** and add the following definitions:

**ASL\_extern FTP\_ALTControl FTP\_Server FTP\_ALTControl**

**ASL\_extern PASV\_Range FTP\_Server PASV\_Range**

The RouteFinder setup is done. However, the FTP server does not know that it is placed behind a DNAT firewall, and thus will give out his 192.168.1.10 address when replying to a PASV command. In addition, we must tell it only to use the ports in our PASV\_Range for passive connections.

Nearly all FTP servers have configuration options to set the IP and port range used for passive mode. In this case with **glftpd**, these are the options:

`pasv_addr 1.2.3.4 1`

`pasv_ports 3000 4000`

See *glftpd.docs* for more info on those configuration options, or check the docs of your particular FTP server if you use another daemon.

**Q17. Do I need to add routes for my connected networks?**

- A17.** No, you never have to add routes for networks in which your RouteFinder is a member. These so-called "Interface Routes" are automatically added by the RouteFinder itself.

**Q18. I have DNAT set up but I cannot connect to the translated services. What is wrong?**

- A18.** You may need to set packet filter rules to allow the traffic. When using DNAT, you must allow the traffic according to the characteristics BEFORE the translation.

For example:

If you translate **1.2.3.4:80** into **192.168.1.10:80**, you must allow **Any->1.2.3.4 port 80 TCP** (http).

When using SNAT, you must allow the traffic according to the characteristics after the translation. For example:

If you translate **SRC 192.168.10.1** into **SRC 1.2.10.1**, you must allow **1.2.10.1 -> any -> any**.

(Note that these are examples only!)

**Q19. Does SOCKS handle UDP?**

**A19.** SOCKS V5 does, SOCKS V4 does not. NEC's SOCKS V5 Reference Implementation includes a socksifiedarchie client program that is a UDP application.

**Q20. How does SOCKS interact with DNS?**

**A20.** For SOCKS version 4.2 and earlier, SOCKS V4 clients MUST resolve local and Internet host IP addresses. Configure DNS so that the SOCKS clients' resolver can resolve the addresses. Multiple DNS servers require special arrangements.

For the extended SOCKS version 4.3, SOCKS V4 clients can pass the unresolved addresses to the SOCKS V4 extended servers for resolution.

For SOCKS V5, the clients can pass unresolved host names to SOCKS V5 servers to resolve. SOCKS will work if the SOCKS V5 client or SOCKS V5 servers can resolve a host.

**Q21. What is a single-homed and multi-homed firewall?**

**A21.** A multi-homed firewall has multiple network interfaces and does not forward packets. Single-homed firewalls have one network interface card. You would use a single-homed firewall with a choke router that filters packets not originating from the SOCKS server.

**Q22. Is there an RFC for SOCKS?**

**A22.** There is no official RFC for Version 4 of the protocol. There are two documents describing Version 4: SOCKS V4 protocol and extension to SOCKS V4 protocol. There are three RFCs for SOCKS V5 related protocols:

RFC1928 - Describes SOCKS Version 5 protocol, also known as Authenticated Firewall Traversal (AFT).

RFC1929 - Describes Username/Password authentication for SOCKS V5.

RFC1961 - Describes GSS-API authentication for SOCKS V5

**Q23. Why does the password echo when I run RFTP?**

**A23.** The password only echoes for anonymous ftp. This is considered a feature.

**Q24. What causes the log message *incompatible version number: 71*?**

**A24.** Socks displays this log message when someone tries to use the SOCKS server as an HTTP proxy. ASCII code 71 is the letter "G", the first letter of an HTTP/1.0 request.

**Q25. Can the RouteFinder manage a full duplex 100M bps line.**

**A25.** The Ethernet ports do support 10/100M bps half-duplex and full duplex lines. The RouteFinder automatically detects the line.

# Chapter 9 – Troubleshooting

**Before you call the Technical Support, check the following:**

1. Review the RouteFinder FAQs in the previous section.
2. Verify that the pre-installation requirements are met. Refer to Chapter 2 of this manual.
3. Verify that the Administrations PC requirements are met (correct Default Gateway configuration, using an HTTPS-compatible Browser, JavaScript and Cascading Style active, and Proxies deactivated in the browser).
4. If you can't establish a connection and the message "**Error: The <software> is not reachable from the local network**" is displayed, try the following:
  - verify IP Addresses in the software are correctly configured
  - verify IP Address of the Client PC is correctly configured
  - verify Default Gateway of the Client PC is correctly configured
  - verify proper Network Cable installation
5. Check for updates to the product documentation on the Multi-Tech Web site at <http://www.multitech.com/DOCUMENTS/>.
6. To troubleshoot TCP/IP connections in Windows 2000, use the Ping, Tracert, and Pathping commands. The Ping command sends an Internet Control Message Protocol (ICMP) packet to a host and waits for a return packet, listing the transit time. If there isn't a return packet, Ping indicates that with a Request Time Out message. The Tracert command traces the route between two hosts and can be useful in determining where in the route a communications problem is occurring. Windows 2000 provides the Pathping command, which combines the features of Ping and Tracert and adds additional features to help you troubleshoot TCP/IP connectivity problems. Pathping sends packets to each router between two hosts and displays a report based on the return packets it receives. This report helps determine which routers in the path are experiencing problems. Check the Lost/Sent columns for an indication of the router experiencing problems. A particular router sustaining a high loss percentage rate is a reasonable indicator that there's a problem with that specific router. Type PATHPING /? at the command prompt to view the syntax for Pathping. NOTE: There is no -r switch; however, there is an -R switch (uppercase) that tests to determine if each hop is RSVP-aware. Also, the -t switch should be -T (uppercase).
7. If you use Internet Connection Sharing (ICS) or demand-dial router connections, and you have the problem of your client computer timing out while waiting for the ICS/demand-dial router to establish the connection. For example, your Web browser might report your home site as unreachable because TCP times out before the server can establish the connection. TCP sets a retransmission timer when it attempts the first data transmission for a connection, with an initial retransmission timeout value of 3 seconds. TCP doubles the retransmission timeout value for each subsequent connection attempt, and by default attempts retransmission twice. By default, the first attempt is made at 3 seconds, the second at 3+6 seconds, and the third at 3+6+12 seconds, for a maximum timeout of 21 seconds. Increasing the initial retransmission timer to 5 seconds would result in a total maximum timeout of 5+10+20, or 35 seconds.  
 For Windows 2000 and Windows NT 4.0 clients, the initial TCP retransmission timeout is defined by the registry value HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\Services\Tcpip\Parameters\InitialRtt. The InitialRtt value is a REG\_DWORD with a valid range from 0-65535 and specifies the timeout in milliseconds. The number of connection attempts is defined by the registry setting HKEY\_LOCAL\_MACHINE\System\CurrentControlSet\Services\Tcpip\Parameters\TcpMaxDataRetransmissions.  
 The TcpMaxDataRetransmissions value is also a REG\_DWORD with a valid range of 0-65535.  
 Caution: Make sure you have verified backup before you change these registry values.
8. If you are using an external keyboard connected to the RouteFinder's PC board using the **KB1** 6-pin female MiniDIN connector, make sure that you are not using an adapter cable (e.g., a 6-pin DIN to 6-pin miniDIN adapter cable).

9. Observe the RouteFinder front panel LEDs. Verify that the **LAN**, **WAN**, and/or **DMZ** LEDs indicate proper RouteFinder operation in terms of the Ethernet **LINK** integrity, transmit/receive activity (**ACT** LED), and speed (**100 MB** /10 MB). Refer to the front panel LEDs description in Chapter 1 of this manual.
10. For problems with RouteFinder filter rules, run **Statistics & Logs > Packet Filter > Filter LiveLog** to view the RouteFinder's defined filter rules, system-generated filter rules, and filter violations.  
The Filter LiveLog supervises the packet filter and NAT rules. The Packet Filter log shows the packets that have not successfully passed the rule set of the packet filter. Click **Open Packet Filter LiveLog**; a window opens with the rule violations listed in order of occurrence.  
**Note:** Packets dropped by the **Drop** setting in **Packet Filters > Packet Filter Rules** do not appear in the **Packet Filter LiveLog**.
11. Attach a monitor and keyboard to the RouteFinder for monitoring and debugging (refer to Chapter 5 of this manual for keyboard and monitor connection information).
12. Run the applicable **Statistics & Logs** function for the RouteFinder's status and performance.

# Appendix A – Disposition of Events for the RouteFinder v3.xx

For ICSA Certification  
Based on  
The Modular Firewall Certification Criteria  
Baseline module - version 4.0

## Revision History

Date	Revision	Remarks/Changes
16-Aug-2004	R1	Baseline document

## I. Abstract

### Disposition of Events

The LVPN RouteFinder 3.2x provides logging capabilities for various types of Access requests to the product.

The logging is classified as follows:

- Inbound Access Requests (LO1.A)
- Outbound Access Requests (LO1.B)
- Access Requests to Firewall Violating Security Policy (LO1.C)
- Access Requests Through Firewall Violating Security Policy (LO1.D)
- Administrative Authentication Log (LO1.E)
- Admin Port Access Requests (LO1.F)
- Startup History (LO1.G)
- User Defined Logs.
- Fragmented Packets Log. (ST6)

### Access Request

An **Access Request** is the first packet arriving at the interface to which the security policy is applied. All subsequent packets that are part of an ongoing session are not termed as access requests since an Access Request is the first packet that establishes a session. Logging of an Access Request implies logging of the first packet of a session. Subsequent packets are not logged.

### Inbound Access Request

Each access request from the external network to the box for any services hosted by the box or hosted by an internal server and have to pass through the firewall is termed as an inbound access request. Requests received on the WAN interface are termed **inbound access request**. If the WAN interface is down and the dial backup PPP link is up, then a request received on the PPP interface to the firewall will be termed **inbound request access**.

Access requests logged as Inbound Access Request correspond to LO1.A of Baseline module - version 4.0, ICSA Labs.

Figure 1 shows Inbound Access diagram

Figure 2 shows a snapshot of Inbound Access.

Figure 3 shows a snapshot of Inbound Access with DNAT and Connection Tracking.

### Outbound Access Request

Each access request from the internal network (LAN/DMZ) to the external network (WAN) that passes through the firewall is termed as an Outbound Access Request. All requests routed out through the WAN interface to servers connected on or through the WAN Interface are considered **Outbound Access Requests**.

Access requests logged as Outbound Access Request correspond to LO1.B of Baseline module - version 4.0, ICSA Labs.

Figure 4 shows Outbound Access diagram.

Figure 5 shows a snapshot of Outbound Access

Figure 6 shows a snapshot of Outbound Access with connection tracking.

### **Access Requests through Firewall Violating Security Policy**

An access request that traverses (routed through the firewall) but has to be dropped due to security restriction is logged as **Through Firewall dropped**.

Access requests logged as Access Request through Firewall Violating Security Policy correspond to LO1.C of Baseline module - version 4.0, ICSA Labs

Figure 7 show a snapshot of Through Firewall Dropped.

### **Access Request to Firewall Violating Security Policy**

An Access request to the firewall can be dropped due to security restrictions. Each of these access requests is logged as **To Firewall Dropped**.

Access requests logged as Access Request to Firewall Violating Security Policy correspond to LO1.D of Baseline module - version 4.0, ICSA Labs.

Figure 8 shows To Firewall dropped diagram.

Figure 9 shows a snapshot of To Firewall Dropped.

### **Administrative Authentication Log**

All successful and failed attempts to login to the VPN can be logged. The attempts are logged as Administrative Authentication Log.

Administrative Authentication Log corresponds to LO1.E of Baseline module - version 4.0, ICSA Labs.

Figure 10 shows a snapshot of Administrative Authentication Log.

### **Admin Port Access Requests**

All requests to the Administrative port (HTTPS/HTTP to the box using the WEB GUI) are logged as Admin Port Traffic.

Access requests logged as Admin Port Access requests correspond to LO1.F of Baseline module - version 4.0, ICSA Labs.

Figure 11 shows a snapshot of Admin Port Access log.

### **Startup History**

The system startup Timestamp is logged as **Startup History**. Startup History corresponds to LO1.G of Baseline module - version 4.0, ICSA Labs.

Figure 12 shows a snapshot of Startup History.

### **User Defined Log**

User defined logging is classified as *User* logs. Administrators can log packets using the **Packet Filers > Add User Defined Packet Filter Rules** and selecting **LOG** as the action.

**Note:** User logging is allowed only on routed packets.

Figure 13 shows a snapshot of user defined log.

### **Fragmented Packets Log**

Fragments packets can be logged as **Dropped Fragmented**. Logging of **Dropped Fragmented Packets** can be configured through **Packet Filters > Advanced > Drop Fragmented Packets**. Logging is allowed only if fragments are dropped.

Figure 14 shows a snapshot of Fragmented Packets log.

### **ICMP Information**

Information about ICMP requests is available in the remarks. *Type* and *Code* information is displayed after the event type.

ICMP information meets requirement LO2.G of Baseline module - version 4.0, ICSA Labs.

Figure 15 shows a snapshot with ICMP information.

### **Description of Syslog Messages**

The syslog message description is given below:

1. **kernel: mtrfThFWia** – Denotes inbound traffic being forwarded by the firewall.
2. **kernel: mtrfToFWa** – Denotes inbound traffic, which is destined to the firewall and is accepted.
3. **kernel: mtrfThFWoa** – Denotes outbound traffic sent by the firewall
4. **kernel: mtrfUSR** – Denotes the packets that are forwarded by the firewall by user defined packet filter rules.
5. **kernel: mtrfThFWd** – Denotes the packets that are not forwarded by the firewall due to security policy violation. These packets are dropped.
6. **kernel: mtrfThFWdR** – Denotes the packets that are not forwarded by the firewall due to security policy violation. These packets are rejected.
7. **kernel: mtrfToFWd** – Denotes the packets that are not accepted by the firewall due to security policy violation. These packets are dropped.
8. **kernel: mtrfAR** – Denotes the accepted HTTP and HTTPS WEB configuration traffic to the firewall .

9. **kernel: mtrfThFWcon** – Denotes connection tracked packets through the firewall.

10. **kernel: mtrfFragDrop** – Denotes dropped fragmented packets.

The following fields are present in the log message for the packet logged:

11. **IN** – Incoming network interface name
12. **OUT** – Outgoing network interface name
13. **MAC** – Destination MAC address
14. **SRC** – Source IP addresses
15. **DST** – Destination IP address
16. **LEN** – Header Length (in bytes)
17. **TOS** – Type of service
18. **TTL** – Time to live
19. **ID** – Identification number
20. **PROTO** – Protocol name
21. **SPT** – Source Port number
22. **DPT** – Destination Port number
23. **WINDOW** – TCP Window size
24. **RES** – Reserved bits
25. **ACK** – TCP Acknowledgment number
26. **FIN** – TCP Flag indicates no more data from sender
27. **URGP** – TCP Urgent pointer
28. **PREC** – Precedence field

## II. Inbound Access Log

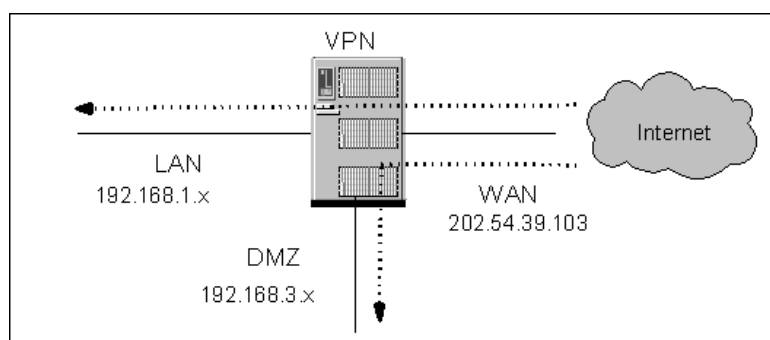


Figure 1 – Inbound Access



SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	
1	11 Aug 2004	18:21:13	204.26.122.9	202.54.39.103	TCP	31108	53	Inbound Accepted
2	11 Aug 2004	18:31:13	204.26.122.9	202.54.39.103	TCP	41216	53	Inbound Accepted

Figure 2 – Snapshot of Inbound Access Log

**Description of Figure 2**

The Access request originated from the source (204.26.122.9) to the destination (204.54.39.103) is accepted by the candidate firewall. Classified as **Inbound Accepted**.

**Inbound Access (DNAT with Connection Tracking)**

SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
1	11 Aug 2004	18:31:23	204.26.122.9	202.54.39.103	TCP	41216	21	Inbound Accepted DNAT ip:port = 192.168.1.76:20:21
2	11 Aug 2004	18:31:34	204.26.122.9	202.54.39.103	TCP	41284	62191	Inbound Accepted [SRC=204.26.122.9:DST=202.54.39.103:SPORT=41216:DPORT=21] Dnat ip:port = 192.168.1.76:21
3	11 Aug 2004	18:31:39	202.54.39.103	204.26.122.9	TCP	20	41331	Inbound Accepted [SRC=204.26.122.9:DST=202.54.39.103:SPORT=41216:DPORT=21] Dnat ip:port = 192.168.1.76:21

Figure 3 – Inbound Access (DNAT with Connection Tracking)

**Description of Figure 3**

The Access request originated from the source (204.26.122.9) to the destination (204.54.39.103), which is further DNATTED to the ip-address 192.168.1.76 on port 20:21.

The above figure illustrates a capture of the FTP service.

- Sln0 1, in the above snapshot corresponds to the control connection (Remarks in the second half of the snapshot is a continuation of the capture).

**Remarks:**

**"Inbound Accepted DNAT ip:port = 192.168.1.76:20:21"**

**Src:** 204.26.122.9, **Dst:** 202.54.39.103, **DNATTED to** 192.168.1.76 on Port 20:21.

The log returned by the SYSLOG application in this particular case is different. The destination address listed in the SYSLOG is the **DNATTED** ip-address. In this case it is 192.168.1.76.

- Sln0 2, corresponds to a PASV Data connection. (Src:204.26.122.9, destined to 202.54.39.103, which in turn is DNATTED to 192.168.1.76 on port 62191).

**Remarks:**

**"Inbound Accepted**

**[SRC=204.26.122.9:DST=202.54.39.103:SPORT=41216:DPORT=21]**

**Dnat ip:port = 192.168.1.76:21"**

- Inbound Accepted** – Inbound Log
  - [SRC=204.26.122.9:DST=202.54.39.103:SPORT=41216:DPORT=21]** – This corresponds to the **"CONTROL connection information"** for this data connection.
  - Dnat ip:port = 192.168.1.76:21"** – This corresponds to the **"CONTROL connection's DNATTED ipaddress"** for this data connection.
- Sln0 3, corresponds to the ACTIVE Data connection originated from 192.168.1.76 (on SRC-PORT 20), which is masqueraded to a SRC:202.54.39.103 at the WAN interface of the candidate firewall, destined to 204.26.122.9.

**Remarks:**

**"Inbound Accepted**

**[SRC=204.26.122.9:DST=202.54.39.103:SPORT=41216:DPORT=21]**

**Dnat ip:port = 192.168.1.76:21"**

- Inbound Accepted** – Inbound Log
- [SRC=204.26.122.9:DST=202.54.39.103:SPORT=41216:DPORT=21]** – This corresponds to the **"CONTROL connection information"** for this data connection.
- Dnat ip:port = 192.168.1.76:21"** – This corresponds to the **"CONTROL connection's DNATTED ipaddress"** for this data connection.



### III. Outbound Access Log

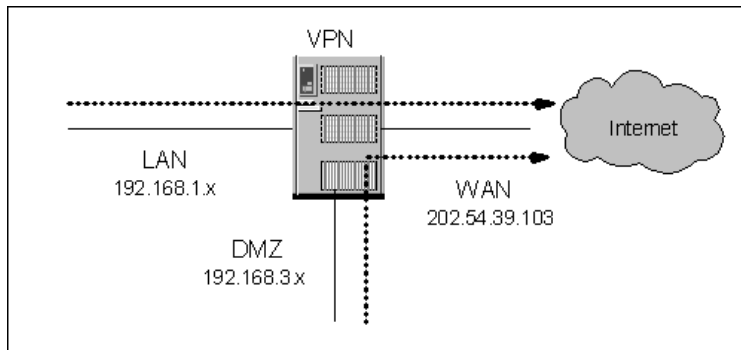


Figure 4 – Outbound Access

SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	
1	11 Aug 2004	18:31:43	192.168.1.76	204.26.122.9	TCP	47945	22	Outbound
2	11 Aug 2004	19:04:08	192.168.1.212	195.220.108.108	TCP	32823	21	Outbound

Figure 5 – Snapshot of Outbound Access Log

SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	
1	11 Aug 2004	18:31:43	192.168.1.76	204.26.122.9	TCP	47945	22	Outbound
2	11 Aug 2004	19:04:08	192.168.1.212	195.220.108.108	TCP	32823	21	Outbound
3	11 Aug 2004	19:04:29	195.220.108.108	192.168.1.212	TCP	20	32824	Outbound [SRC=192.168.1.212; DST=195.220.108.108; SPORT=32823; DPORT=21]
4	11 Aug 2004	19:04:32	192.168.1.212	195.220.108.108	TCP	32825	41545	Outbound [SRC=192.168.1.212; DST=195.220.108.108; SPORT=32823; DPORT=21]
5	11 Aug 2004	19:11:10	192.168.1.76	205.156.51.200	TCP	48020	80	Outbound
6	11 Aug 2004	19:11:11	192.168.1.76	209.132.177.110	TCP	48021	443	Outbound
7	11 Aug 2004	19:21:10	192.168.1.76	205.156.51.200	TCP	48030	80	Outbound

In IP	Protocol	Source port	Destination port	Remarks
192.168.1.76	TCP	47945	22	Outbound
192.168.1.212	TCP	32823	21	Outbound
195.220.108.108	TCP	20	32824	Outbound [SRC=192.168.1.212; DST=195.220.108.108; SPORT=32823; DPORT=21]
192.168.1.212	TCP	32825	41545	Outbound [SRC=192.168.1.212; DST=195.220.108.108; SPORT=32823; DPORT=21]
192.168.1.76	TCP	48020	80	Outbound
192.168.1.76	TCP	48021	443	Outbound
192.168.1.76	TCP	48030	80	Outbound

Figure 6 – Snapshot of Outbound Access Log (with Connection Tracking)

#### Description of Figure 6

The FTP Access request originated from the source (192.168.1.212 [SINO 2]) to the destination (195.220.108.108).

The above figure illustrates a capture of FTP service.

- Sino 2, in the above snapshot, corresponds to the control connection (Remarks in the second half of the snapshot is a continuation of the capture).

Remarks:

“Outbound”

Src: 192.168.1.212, Dst: 195.220.108.108 on Port: 21.

- Sino 3 corresponds to a ACTIVE Data connection, originated by the FTP Server: 195.220.108.108, destined to: 192.168.1.212, on destination port: 32824

Remarks:

“Outbound”

[SRC=192.168.1.212; DST=195.220.108.108; SPORT=32823; DPORT=21]

- Outbound – Outbound Log
- [SRC=192.168.1.212; DST=195.220.108.108; SPORT=32823; DPORT=21] – This corresponds to the **CONTROL connection information** for this data connection.

- Sln0 4 corresponds to the PASV Data connection originated from 192.168.1.212 destined to 195.220.108.108.

**Remarks:****“Outbound**

**[SRC=192.168.1.212:DST=195.220.108.108:SPORT=32823:DPORT=21]”**

- **Outbound** – Outbound Log
- **[SRC=192.168.1.212: DST=195.220.108.108: SPORT=32823: DPORT=21]”** – This corresponds to the **CONTROL connection information** for this data connection.

#### IV. Access Requests through Firewall Dropped

Log Display - Microsoft Internet Explorer								
SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
1	12 Aug 2004	14:44:12	192.168.1.212	216.239.37.99	TCP	33123	8000	Traverse Firewall Dropped
2	12 Aug 2004	14:44:15	192.168.1.212	216.239.37.99	TCP	33123	8000	Traverse Firewall Dropped
3	12 Aug 2004	14:44:21	192.168.1.212	216.239.37.99	TCP	33123	8000	Traverse Firewall Dropped
4	12 Aug 2004	14:44:33	192.168.1.212	216.239.37.99	TCP	33123	8000	Traverse Firewall Dropped
5	12 Aug 2004	14:44:57	192.168.1.212	216.239.37.99	TCP	33123	8000	Traverse Firewall Dropped

Figure 7 – Snapshot of Through Firewall Dropped Log

#### V. Access Requests to Firewall Dropped

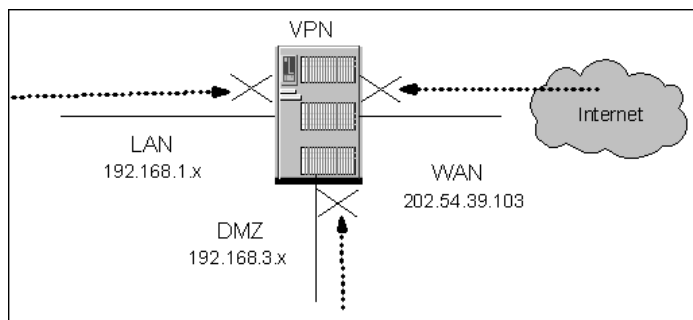


Figure 8 – Access Requests to Firewall Dropped

Log Display - Microsoft Internet Explorer								
SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
1	11 Aug 2004	19:04:32	205.156.1.110	202.54.39.103	TCP	32825	80	To Firewall Dropped

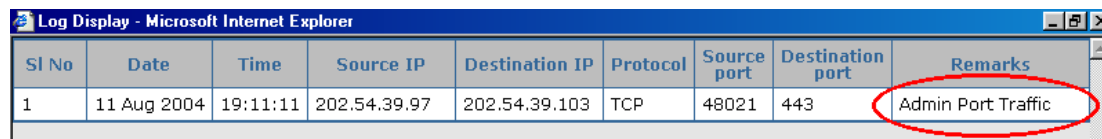
Figure 9 – Snapshot of To Firewall Dropped Log

#### VI. Administrative Authentication Logs

Administrative Authentication Log - Microsoft Internet Explorer					
SI No	Date	Time	Username	From (IP)	Remarks
1	13 Aug 2004	17:22:56	admin	192.168.1.105	passed.
2	13 Aug 2004	17:23:07	admin	192.168.1.105	failed. Invalid Password
3	13 Aug 2004	17:23:19	adm	192.168.1.105	failed. Invalid Username
4	13 Aug 2004	17:23:25	admin	192.168.1.105	passed.

Figure 10 – Snapshot of Administrative Authentication Log

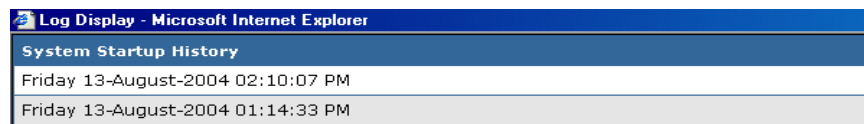
## VII. Admin Port Access Log



SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
1	11 Aug 2004	19:11:11	202.54.39.97	202.54.39.103	TCP	48021	443	Admin Port Traffic

Figure 11 – Snapshot of Admin Port Access Log

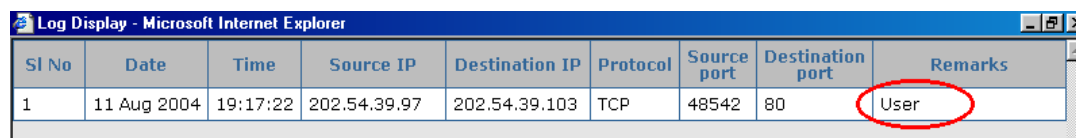
## VIII. Startup History Log



System Startup History	Date	Time
Friday 13-August-2004 02:10:07 PM		
Friday 13-August-2004 01:14:33 PM		

Figure 12 – Snapshot of Startup History

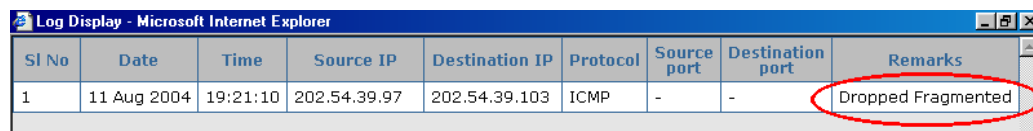
## IX. User Log



SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
1	11 Aug 2004	19:17:22	202.54.39.97	202.54.39.103	TCP	48542	80	User

Figure 13 – Snapshot of User Log

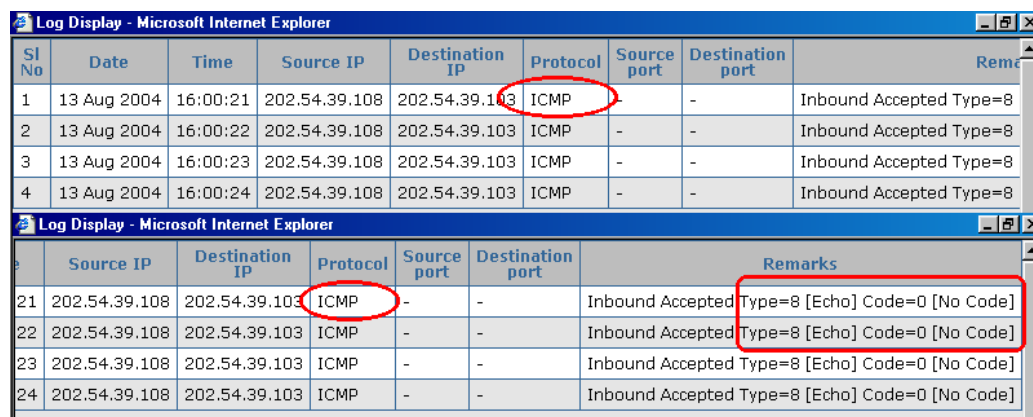
## X. Fragmented Dropped Log



SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
1	11 Aug 2004	19:21:10	202.54.39.97	202.54.39.103	ICMP	-	-	Dropped Fragmented

Figure 14 – Snapshot of Fragmented Dropped Log

## XI. ICMP Information



SI No	Date	Time	Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
1	13 Aug 2004	16:00:21	202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8
2	13 Aug 2004	16:00:22	202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8
3	13 Aug 2004	16:00:23	202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8
4	13 Aug 2004	16:00:24	202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8

Source IP	Destination IP	Protocol	Source port	Destination port	Remarks
202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8 [Echo] Code=0 [No Code]
202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8 [Echo] Code=0 [No Code]
202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8 [Echo] Code=0 [No Code]
202.54.39.108	202.54.39.103	ICMP	-	-	Inbound Accepted Type=8 [Echo] Code=0 [No Code]

Figure 15 – Snapshot of Log with ICMP Information

# Appendix B – The RouteFinder Rescue Kernel

## ***What Is a Rescue Kernel?***

Rescue Kernel is a software program that allows you to reinstall the RouteFinder software without connecting the CD-ROM drive and using the RouteFinder software CD.

With the Rescue Kernel you can configure the WAN IP and default gateway. You can perform everything remotely without having to be onsite. After the reinstallation is complete, you can use the RouteFinder software to access the WAN IP from the Internet assuming the public IP and default gateway were configured properly.

## ***Before You Start***

### **1. Configuration Backup**

Backup your current RouteFinder configuration file and note the software version you are currently running.

### **2. Record License Key Numbers**

- Locate your System license key and write it down. You will need this key after the software is installed.
- Locate your URL license key and write it down. You will need this if you planning to use the URL filter.
- If you have purchased and use the anti-virus options, locate your Anti-Virus license key file and write it down. You will need this to import the anti-virus software.

## ***Links You Will Need During the Install Process***

Link to Download Windows FTP Server:

<http://support.jgaa.com>

Link to Download Windows WinSCP Client:

<http://winscp.sourceforge.net/eng/>

Link to Download Putty Telnet/SSH Client:

<http://www.chiark.greenend.org.uk/>

## Three Methods for Performing the Software Reinstallation Using Rescue Kernel

**Method 1** – This method uses no external server.

**Method 2** – This method uses an external FTP server.

**Method 3** – This method can be used if Method 1 and 2 fail.

### Method 1 – How to Perform the Install Using No External Server

**Assumptions:** Your RouteFinder still has SSH access and you are still able to copy files onto the RouteFinder box.

1. Connect a workstation via the Ethernet to the LAN port of the RouteFinder box.
2. Use WinSCP to copy the RouteFinder ISO image to the RouteFinder **/home/loginuser** directory and then use the Putty utility to move it to the **/root** directory (see the ISO notes above).  
Please contact [support@multitech.com](mailto:support@multitech.com) for a link to download the RouteFinder ISO image.
3. Use the Putty utility to execute the following commands.
  - Type in **cd /boot** and **./create\_netinstall\_cfg**.
  - At the following prompts, type the responses as indicated here:
    - ◆ Do you want to use the network install (y/n): n
    - ◆ Enter the ISO file name that is present in the root directory (/): RouteFinder3xx.iso.
    - ◆ Make sure the file name is the same as Step 2 (case sensitive). See the ISO Notes at the beginning of this chapter.
    - ◆ Do you want an unattended install (y/n): y
    - ◆ Do you want to modify the current interface configuration (y/n): n  
If you answer y (yes), you can configure the LAN and WAN interface to match up with your network.
  - **Note:** If any of these questions are answered incorrectly, execute the **./create\_netinstall\_cfg** command again and answer all questions correctly.
  - Type in **lilo -R RFNetInstall**.
  - Type in **reboot**.
4. Connect a monitor to the RouteFinder and monitor to make sure the install process does not show any problems. If there are problems during the install, you will need to use Method 3 to recover.  
If you do not have a monitor, you can listen for the following beep patterns:
  - The first three beeps. These beeps signal that the system is restarting in order to run Rescue Kernel.
  - The second five beeps. These beeps signal that the installation is done.
  - The third five beeps. These beeps signal that the software is running and is ready to use.
- **Note:** The install process will take sometime.
5. After installation is done and you have rebooted, you should be able to use WebAdmin to access the LAN port via IP address <https://192.168.2.1>
6. Configure your RouteFinder with live internet access. Then perform the live update to match the version you were running. Then import the backup configuration file.

## Method 2 – How to Perform the Install Using an External FTP Server

**Assumptions:** Your workstation is on IP address 192.168.2.2.  
The LAN port of RouteFinder is on ip address 192.168.2.1.

1. Connect a workstation via the Ethernet to the LAN port of the RouteFinder box.
2. Create an FTP server on the workstation and copy the RouteFinder ISO image file onto the FTP server root directory. Setup the FTP server with anonymous access. Test your FTP server with anonymous access so it shows the RouteFinder ISO image file in the root directory after an anonymous login. You can test your FTP server on the same machine by access IP ftp://127.0.0.1.

Please contact support@multitech.com for a link to download the RouteFinder ISO image.

In the Jgaa FTP server, you will need to increase the number for allowing more FTP sessions and allowing more TCP connections. Change both of the settings to 10.

3. Use the Putty utility to execute the following commands:
  - Type in **cd /boot** and **./create\_netinstall\_cfg**.
  - At the following prompts, type the responses as indicated here:
    - ◆ Do you want to use the network install (y/n): y
    - ◆ Enter the interface to use (eth0/eth1/eth2) : eth0
    - ◆ Enter the IP address (IP/mask); e.g., (192.168.1.1/24): 192.168.2.1/24
    - ◆ Enter the default Gateway [Optional] :
    - ◆ Enter the Nameserver [Optional] :
    - ◆ Enter the protocol to be used (ftp/http/tftp) : ftp
    - ◆ For FTP, enter the URL (IP address or domain name): ftp://192.168.2.2
    - ◆ Enter the ISO path and filename: RouteFinder3xx.iso.
    - ◆ Make sure the file name is the same as Step 2 (case sensitive). See the ISO notes at the beginning of this chapter.
    - ◆ Do you want an unattended install (y/n): y
    - ◆ Do you want to modify the current interface configuration (y/n): n

If you answer y (yes), you can configure the LAN and WAN interface to match up with your network.

**Note:** If any of these questions are answered incorrectly, execute the **./create\_netinstall\_cfg** command again and answer all questions correctly.

- Type in **lilo -R RFNetInstall**.
  - Type in **reboot**.
4. Connect a monitor to the RouteFinder and monitor to make sure the install process does not show any problems. If there are problems during the install, you will need to use Method 3 to recover.  
If you do not have a monitor, you can listen for the follow beep patterns:
    - The first three beeps. These beeps signal that the system is restarting in order to run the Rescue Kernel.
    - The second five beeps. These beeps signal that the installation is done.
    - The third five beeps. These beeps signal that the software is running and is ready to use.
  5. The install process will take sometime depending on the method.
  6. After installation is done and you have rebooted, you should be able to use WebAdmin to access the LAN port via IP address https://192.168.2.1
  7. Configure your RouteFinder with live internet access. Then perform the live update to match the version you were running. Then import the backup configuration file.

### Method 3 – How to Perform the Install If the Other Methods Fail or If the File Systems Are Corrupted

*Use this method if Methods 1 and 2 have failed or if the file systems are totally corrupted and the RouteFinder can boot only with Rescue Kernel.*

1. Set up an external FTP server. Refer to the steps above in Method 2.
2. Connect a monitor and keyboard to the RouteFinder box. During bootup, right after the BIOS messages, you must press <ALT+TAB> when you see the word **LILO**. You have only a few seconds, so you will have to be fast. Otherwise, the RouteFinder will boot into the regular software.
3. If <ALT+TAB> works, you will see a prompt. At the prompt, type in **RFNetInstall** (case sensitive).
4. Rescue Kernel terminates after the install process. You can also terminate during the Rescue Kernel boot process by pressing Ctrl+C.
5. Then, at the prompt, type in the following:
  - **cd /boot**
  - **./create\_netinstall\_cfg** (See Step 6 in Method 2 for ./create\_netinstall\_cfg directions.)  
**Note:** If you need to set up FTP, see Step 2 in Method 2.
  - **reboot**
6. The install process will take sometime depending on the method you use.
7. After the installation is done and you have rebooted, you should be able to use WebAdmin to access the LAN port via IP address <https://192.168.2.1>.
8. Configure your RouteFinder with live internet access. Then perform the live update to match the version you were running. Then import the backup configuration file.

# Appendix C – Table of Commonly Supported Subnet Addresses

This table lists commonly supported Subnets organized by Address.

255.255.255.128 /25	<b>Network Number</b>	<b>Hosts Available</b>	<b>Broadcast Address</b>
	N.N.N.0 N.N.N.128	N.N.N.1-126 N.N.N.129-254	N.N.N.127 N.N.N.255
255.255.255.192 /26	<b>Network Number</b>	<b>Hosts Available</b>	<b>Broadcast Address</b>
	N.N.N.0	N.N.N.1-62	N.N.N.63
	N.N.N.64	N.N.N.65-126	N.N.N.127
	N.N.N.128	N.N.N.129-190	N.N.N.191
255.255.255.224 /27	N.N.N.192	N.N.N.193-254	N.N.N.255
	<b>Network Number</b>	<b>Hosts Available</b>	<b>Broadcast Address</b>
	N.N.N.0	N.N.N.1-30	N.N.N.31
	N.N.N.32	N.N.N.33-62	N.N.N.63
	N.N.N.64	N.N.N.65-94	N.N.N.95
	N.N.N.96	N.N.N.97-126	N.N.N.127
	N.N.N.128	N.N.N.129-158	N.N.N.159
	N.N.N.160	N.N.N.161-190	N.N.N.191
255.255.255.240 /28	N.N.N.192	N.N.N.193-222	N.N.N.223
	N.N.N.224	N.N.N.225-254	N.N.N.255
	<b>Network Number</b>	<b>Hosts Available</b>	<b>Broadcast Address</b>
	N.N.N.0	N.N.N.1-14	N.N.N.15
	N.N.N.16	N.N.N.17-30	N.N.N.31
	N.N.N.32	N.N.N.33-46	N.N.N.47
	N.N.N.48	N.N.N.49-62	N.N.N.63
	N.N.N.64	N.N.N.65-78	N.N.N.79
	N.N.N.80	N.N.N.81-94	N.N.N.95
	N.N.N.96	N.N.N.97-110	N.N.N.111
	N.N.N.112	N.N.N.113-126	N.N.N.127
	N.N.N.128	N.N.N.129-142	N.N.N.143
	N.N.N.144	N.N.N.145-158	N.N.N.159
	N.N.N.160	N.N.N.161-174	N.N.N.175
	N.N.N.176	N.N.N.177-190	N.N.N.191
255.255.255.248 /29	N.N.N.192	N.N.N.193-206	N.N.N.207
	N.N.N.208	N.N.N.209-222	N.N.N.223
	N.N.N.224	N.N.N.225-238	N.N.N.239
	N.N.N.240	N.N.N.241-254	N.N.N.255
	<b>Network Number</b>	<b>Hosts Available</b>	<b>Broadcast Address</b>
	N.N.N.0	N.N.N.1-6	N.N.N.7
	N.N.N.8	N.N.N.9-14	N.N.N.15
	N.N.N.16	N.N.N.17-22	N.N.N.23
	N.N.N.24	N.N.N.25-30	N.N.N.31
	N.N.N.32	N.N.N.33-38	N.N.N.39
	N.N.N.40	N.N.N.41-46	N.N.N.47
	N.N.N.48	N.N.N.49-54	N.N.N.55
	N.N.N.56	N.N.N.57-62	N.N.N.63
	N.N.N.64	N.N.N.65-70	N.N.N.71
	N.N.N.72	N.N.N.73-78	N.N.N.79
	N.N.N.80	N.N.N.81-86	N.N.N.87
	N.N.N.88	N.N.N.89-94	N.N.N.95
	N.N.N.96	N.N.N.97-102	N.N.N.103
	N.N.N.104	N.N.N.105-110	N.N.N.111
	N.N.N.112	N.N.N.113-118	N.N.N.119
	N.N.N.120	N.N.N.121-126	N.N.N.127
	N.N.N.128	N.N.N.129-134	N.N.N.135
	N.N.N.136	N.N.N.137-142	N.N.N.143
	N.N.N.144	N.N.N.145-150	N.N.N.151
	N.N.N.152	N.N.N.153-158	N.N.N.159
	N.N.N.160	N.N.N.161-166	N.N.N.167
	N.N.N.168	N.N.N.169-174	N.N.N.175
	N.N.N.176	N.N.N.177-182	N.N.N.183
	N.N.N.184	N.N.N.185-190	N.N.N.191



	N.N.N.192	N.N.N.193-198	N.N.N.199
	N.N.N.200	N.N.N.201-206	N.N.N.207
	N.N.N.208	N.N.N.209-214	N.N.N.215
	N.N.N.216	N.N.N.217-222	N.N.N.223
	N.N.N.224	N.N.N.225-230	N.N.N.231
	N.N.N.232	N.N.N.233-238	N.N.N.239
	N.N.N.240	N.N.N.241-246	N.N.N.247
	N.N.N.248	N.N.N.249-254	N.N.N.255
	<b>Network Number</b>	<b>Hosts Available</b>	<b>Broadcast Address</b>
255.255.255.252 /30	N.N.N.0	N.N.N.1-2	N.N.N.3
	N.N.N.4	N.N.N.5-6	N.N.N.7
	N.N.N.8	N.N.N.9-10	N.N.N.11
	N.N.N.12	N.N.N.13-14	N.N.N.15
	N.N.N.16	N.N.N.17-18	N.N.N.19
	N.N.N.20	N.N.N.21-22	N.N.N.23
	N.N.N.24	N.N.N.25-26	N.N.N.27
	N.N.N.28	N.N.N.29-30	N.N.N.31
	N.N.N.32	N.N.N.33-34	N.N.N.35
	N.N.N.36	N.N.N.37-38	N.N.N.39
	N.N.N.40	N.N.N.41-42	N.N.N.43
	N.N.N.44	N.N.N.45-46	N.N.N.47
	N.N.N.48	N.N.N.49-50	N.N.N.51
	N.N.N.52	N.N.N.53-54	N.N.N.55
	N.N.N.56	N.N.N.57-58	N.N.N.59
	N.N.N.60	N.N.N.61-62	N.N.N.63
	N.N.N.64	N.N.N.65-66	N.N.N.67
	N.N.N.68	N.N.N.69-70	N.N.N.71
	N.N.N.72	N.N.N.73-74	N.N.N.75
	N.N.N.76	N.N.N.77-78	N.N.N.79
	N.N.N.80	N.N.N.81-82	N.N.N.83
	N.N.N.84	N.N.N.85-86	N.N.N.87
	N.N.N.88	N.N.N.89-90	N.N.N.91
	N.N.N.92	N.N.N.93-94	N.N.N.95
	N.N.N.96	N.N.N.97-98	N.N.N.99
	N.N.N.100	N.N.N.101-102	N.N.N.103
	N.N.N.104	N.N.N.105-106	N.N.N.107
	N.N.N.108	N.N.N.109-110	N.N.N.111
	N.N.N.112	N.N.N.113-114	N.N.N.115
	N.N.N.116	N.N.N.117-118	N.N.N.119
	N.N.N.120	N.N.N.121-122	N.N.N.123
	N.N.N.124	N.N.N.125-126	N.N.N.127
	N.N.N.128	N.N.N.129-130	N.N.N.131
	N.N.N.132	N.N.N.133-134	N.N.N.135
	N.N.N.136	N.N.N.137-138	N.N.N.139
	N.N.N.140	N.N.N.141-142	N.N.N.143
	N.N.N.144	N.N.N.145-146	N.N.N.147
	N.N.N.148	N.N.N.149-150	N.N.N.151
	N.N.N.152	N.N.N.153-154	N.N.N.155
	N.N.N.156	N.N.N.157-158	N.N.N.159
	N.N.N.160	N.N.N.161-162	N.N.N.163
	N.N.N.164	N.N.N.165-166	N.N.N.167
	N.N.N.168	N.N.N.169-170	N.N.N.171
	N.N.N.172	N.N.N.173-174	N.N.N.175
	N.N.N.176	N.N.N.177-178	N.N.N.179
	N.N.N.180	N.N.N.181-182	N.N.N.183
	N.N.N.184	N.N.N.185-186	N.N.N.187
	N.N.N.188	N.N.N.189-190	N.N.N.191
	N.N.N.192	N.N.N.193-194	N.N.N.195
	N.N.N.196	N.N.N.197-198	N.N.N.199
	N.N.N.200	N.N.N.201-202	N.N.N.203
	N.N.N.204	N.N.N.205-206	N.N.N.207
	N.N.N.208	N.N.N.209-210	N.N.N.211
	N.N.N.212	N.N.N.213-214	N.N.N.215
	N.N.N.216	N.N.N.217-218	N.N.N.219
	N.N.N.220	N.N.N.221-222	N.N.N.223
	N.N.N.224	N.N.N.225-226	N.N.N.227
	N.N.N.228	N.N.N.229-230	N.N.N.231
	N.N.N.232	N.N.N.233-234	N.N.N.235
	N.N.N.236	N.N.N.237-238	N.N.N.239
	N.N.N.240	N.N.N.241-242	N.N.N.243
	N.N.N.244	N.N.N.245-246	N.N.N.247
	N.N.N.248	N.N.N.249-250	N.N.N.251
	N.N.N.252	N.N.N.253-254	N.N.N.255

# Appendix D – Hardware Upgrades & Add-ons and Software Add-ons

## Hardware Upgrades and Add-ons

This section provides the information needed to perform RouteFinder field upgrades.

**Caution:** Use industry-standard grounding supplies and procedures so that you do not damage the PC board or upgrade components.

### Top Cover Removal

As the first step for all upgrade procedures, use this procedure to remove the RouteFinder top cover.

1. Turn off RouteFinder power and remove the RouteFinder power cord.
2. Remove all of the RouteFinder back panel cable connections.
3. Remove the retaining screws that secure the top cover to the chassis. Save the screws for top cover replacement.
4. Carefully slide the top cover forward and then off of the chassis, being careful not to catch the top cover on any cables or to bump any of the board components. You may want to use a small flat blade screwdriver to gently pry the top cover away from the chassis at the retaining screw hole near the middle of the back panel.
5. Perform the desired upgrade following the instructions in the following sections.
6. To replace the top cover, perform Steps 1-3 above in reverse order.

### Memory Upgrade

The RF850 is shipped with 512MB and can be upgraded to a total of 2GB.

The RF860 is shipped with 1GB and can be upgraded to a total of 2GB.

1. Remove the RouteFinder top cover using the procedure earlier in this chapter.
2. Pull back on the beige plastic DIMM retaining tabs on both sides of the DIMM holder at M1.
3. Carefully remove the existing DIMM card.
4. Insert the upgrade DIMM card following the manufacturer's documentation.

### CD-ROM Drive Add-on

The disk drive ribbon cable is terminated with a connector for the disk drive, as well as a connector for connecting a CD-ROM drive. To connect a CD-ROM drive, perform the following procedure.

1. Remove the RouteFinder top cover using the procedure earlier in this chapter.
2. Remove the TY-RAP holding down the cable.
3. Remove the 44-pin - 40-pin converter from the cable.
4. Connect the CD-ROM drive to the CD-ROM connector at the end of the disk drive ribbon cable.

### Keyboard Connection

KB1 is a keyed 6-pin MiniDIN PS/2 interface on the RouteFinder board used for connecting a keyboard. Perform the following steps to attach a keyboard to the unit for configuration and reporting.

1. Remove the RouteFinder top cover using the procedure earlier in this chapter.
2. Connect the keyboard to the **KB1** keyed connector.

### Monitor Connection

Perform the following steps to attach a VGA monitor to the RouteFinder for configuration and reporting.

1. Remove the RouteFinder top cover using the procedure earlier in this chapter.
2. Connect the monitor to the RouteFinder back panel DB15 High Density **DSUB** connector using a DB9-to-DB15 cable.

## ***Rack Mounting***

The RouteFinder is shipped with four rubber feet for desktop applications, two rack mounting brackets, and four mounting screws.

**Note:** Rack Mount screws are provided to attach the brackets to the RouteFinder. It is up to you to provide the bracket-to-rack rack mounting screws that match your rack's thread size.

Use the rack manufacturer's documentation and procedure to safely and securely install the RouteFinder in almost any 19" rack.

## **Software Add-ons**

Listed below are the software add-ons available for the RouteFinder:

### ***IPSec VPN Client Software***

The IPSec VPN Client software is available in 1-, 5-, and 10-user packages. The RouteFinder provides client software (30-day trial Internet version with Static IP support). It allows client computer connection to the RouteFinder using PSK (Pre Shared Keys) in a Host-to-Net connection. (See the separate IPSec Reference Guide for a description of the IPSec VPN client setup process.) To upgrade to the full 1-, 5-, or 10-user IPSec VPN client package, order the applicable model (RFIPSC2-5 or RFIPSC2-10) from Multi-Tech for the number of users that you require.

<b><u>Model</u></b>	<b><u>Description</u></b>
RFIPSC2-1	IPSec VPN Client 1-User License
RFIPSC2-5	IPSec VPN Client 5-User License
RFIPSC2-10	IPSec VPN Client 10-User License
RFAVUPG	1-Year Email Anti-Virus Upgrade

### ***Email Anti-Virus Code***

The RouteFinder is shipped with Email Anti-Virus code within the core software. Order model # RFAVUPG to obtain the software key that enables this Email Anti-Virus Protection subscription for a one-year time period. The one-year 'subscription' must be renewed to continue the anti-virus support. You will receive renewal notices from Multi-Tech prior to the end of your subscription.

The latest virus pattern updates can then be downloaded from the Multi-Tech server. The RouteFinder's auto-update feature lets it connect to the server and automatically download and install these new virus pattern files at user-defined intervals. The optional email virus protection subscription utilizes a high-performance, ICSA-tested, anti-virus engine which checks both incoming and outgoing email for viruses in real-time (See the Tracking section).

The RouteFinder Email Anti-Virus software is an optional purchase.

For a free 30-day evaluation, go to:

<http://www.multitech.com/register/eval/>

To purchase the one year RouteFinder Email Anti-Virus software upgrade, go to:

<http://www.multitech.com/PRODUCTS/RouteFinderVPN/>

If you purchased the RouteFinder Email Anti-Virus software and need to activate the option, go to:

<http://www.multitech.com/register/rfavupg/>

Complete and submit the form and a new license key will be emailed or faxed to you within 24 hours or the next business day. Included with your new license will be instructions for installing the new key.

**Note: Anti-Virus Copyright.** The RouteFinder Email Anti-Virus software is provided by Kaspersky Anti-Virus engine copyrighted by Kaspersky Labs.

## Appendix E – RouteFinder Maintenance

This section covers issues related to routinely maintaining the RouteFinder:

- Housekeeping
- Monitoring
- Updating

### Housekeeping

Housekeeping includes the on-going list of tasks that you need to perform to keep your environment safe and clean. The three main housekeeping tasks that you'll need to revisit periodically are:

- **System backups** – This includes regular backups of RouteFinder configurations and reporting logs. Much of the system backup effort can be done automatically on the RouteFinder.
- **Accounts management** – Includes adding new accounts correctly, deleting old ones promptly, and changing passwords regularly. You should arrange to get termination notification when someone leaves your organization (e.g., for your company's full-time and contract employees, or your university's graduating students). This should involve managing Certification and Key expiration dates, maintaining current email address or addresses for alerts and notifications (e.g., from the Administration menu), as well as maintaining the overall WebAdmin password from the Administration menu.
- **Shared Secret Maintenance** – Most secure protocols provide for mutual authentication (server-to-client and client-to-server). Most ways of doing this are based on the same process: each side "proves" that it can decrypt a value that only the "authentic" participant can know. This secret could be the private half of a public key / private key pair, or it could be a key used along with a symmetric algorithm. In both authentication methods each side sends the other an 'unpredictable' value, and then gets it back in a form that proves that the other side was able to decrypt it.  
Public key cryptography provides excellent data protection, but it's fairly slow. A convenient method is to use a temporary key (AKA, a session key) for most transactions, and then destroy the session key when the transaction is completed. Here, a secure protocol negotiates a session key that is used for a single transaction. The session key is still unpredictable and secure, but takes a lot less time to generate. However, when using the temporary (session) key method, it becomes important for the administrator to destroy quickly and systematically the shared secrets once they are used. Using *partial perfect forwarding secrecy* the shared secret is destroyed after a set period of time. When using perfect secret forwarding, the administrator is responsible for destroying used shared secrets.
- **Disk space management** – Includes timely 'cleanup' of random program and data files to avoid wondering if a program is a leftover from a previous user, or a required program needed for a new install, or a program that an intruder left behind as a 'present' for someone to open. Eliminating unneeded files will allow more room on the hard drive for important logs and reports.
- **Authentication Keys Maintenance** – Authentication keys need to be unpredictable, and random numbers can often be necessarily involved. You'll want to change authentication keys often, since the longer a key is used, the more likely it is to be discovered or accidentally disclosed.

### Monitoring

Here you need to keep track of your system in terms of 'normal' usage so you can tell:

- If your RouteFinder is working.
- If your RouteFinder has been compromised.
- What kinds of attacks are being perpetrated.
- If your RouteFinder is providing the services your users need, or if upgrades or add-ons are needed.

To be proactive in solving these issues, keep track of usage reports and logs (refer to the sections on **User Authentication**, **Tracking**, and **Statistics & Logs** in Chapter 3). For information on RouteFinder upgrades and add-ons refer to the preceding section, **Software Upgrades and Add-ons**.

## Updating

This involves keeping both yourself and your RouteFinder abreast of new bugs, new attacks and new patches, new tools and resources, etc. Much of the RouteFinder updating effort can be done automatically (refer to the **Tracking > Update Service** section in Chapter 3). Administrators can keep themselves current with mailing lists, news groups, security forums, etc. (Refer to the section on Pre-Installation Planning in Chapter 2 of this manual for additional sources of information).

The SANS Institute and the National Infrastructure Protection Center (NIPC) produced a document summarizing the Twenty Most Critical Internet Security Vulnerabilities. Thousands of organizations use the list to prioritize their efforts so they could close the most dangerous holes first. It is segmented into three categories: General Vulnerabilities, Windows Vulnerabilities, and Unix Vulnerabilities. The SANS/FBI Top Twenty list is valuable because the majority of successful attacks on computer systems via the Internet can be traced to exploitation of security flaws on this list. While manually checking a system for each of the listed vulnerabilities is possible, a more practical way to find UNIX and Windows vulnerabilities is to use an automated scanner.

Bob Todd, the author of the free Internet scanner SARA, created a version of SARA that finds and reports on the status of the SANS/FBI Top Twenty list. SARA's Top Twenty Vulnerability scanner is available from the Center for Internet Security ([www.cisecurity.org](http://www.cisecurity.org)). You can download a copy from this site.

Several commercial vulnerability scanners may also be used to scan for these vulnerabilities, and the SANS Institute maintains a list of all scanners that provide a focused Top Twenty scanning function at [www.sans.org/](http://www.sans.org/)

## Appendix F – Ordering Accessories

SupplyNet, Inc. supplies replacement transformers, cables, and connectors for select Multi-Tech products. You can place an order with SupplyNet via mail, phone, fax, or the Internet at:

Mail: SupplyNet, Inc.  
614 Corporate Way  
Valley Cottage, NY 10989  
Phone: 800 826-0279  
Fax: 914 267-2420  
Email: [info@thesupplynet.com](mailto:info@thesupplynet.com)  
Internet: <http://www.thesupplynet.com>

### ***SupplyNet Online Ordering Instructions***

1. Browse to <http://www.thesupplynet.com>. In the Browse by Manufacturer drop-down list, select Multi-Tech and click GO!
2. To order, type in the quantity, and click Add to Order.
3. Click Review Order to change your order.
4. After you have selected all of your items, click Checkout to finalize the order. The SupplyNet site uses Verisign's Secure Socket Layer (SSL) technology to ensure your complete shopping security.

# Appendix G – Regulatory Compliance

## **EMC, Safety, and R&TTR Directive Compliance**

The CE mark is affixed to this product to confirm compliance with the following European Community Directives:

Council Directive 89/336/EEC of 3 May 1989 on the approximation of the laws of Member States relating to electromagnetic compatibility. and

Council Directive 73/23/EEC of 19 February 1973 on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits; and

Council Directive 1999/5/EC of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

## **FCC Part 15 Regulation for the Modem Operation**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference that may cause undesired operation.

**Warning:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## **FCC Part 68 Telecom for the Modem Operation**

1. This equipment complies with Part 68 of the Federal Communications Commission (FCC) rules. On the outside surface of this equipment is a label that contains, among other information, the FCC registration number. This information must be provided to the telephone company.
2. As indicated below, the suitable jack (Universal Service Order Code connecting arrangement) for this equipment is shown. If applicable, the facility interface codes (FIC) and service order codes (SOC) are shown.
3. An FCC-compliant telephone cord with modular plug is provided with this equipment. This equipment is designed to be connected to the phone network or premises wiring using a compatible modular jack which is Part 68 compliant. See installation instructions for details.
4. The ringer equivalence number (REN) is used to determine the number of devices that may be connected to the phone line. Excessive REN's on the phone line may result in the device not ringing in response to an incoming call. In most, but not all areas, the sum of the REN's should not exceed (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total REN's, contact the local phone company.
5. If this equipment causes harm to the phone network, the phone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the phone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
6. The phone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the phone company will provide advance notice in order for you to make necessary modifications in order to maintain uninterrupted service.
7. If trouble is experienced with this equipment (the model of which is indicated below) please contact Multi-Tech Systems, Inc., at the address shown below for details of how to have repairs made. If the equipment is causing harm to the network, the phone company may request that you remove the equipment from the network until the problem is resolved.
8. No repairs are to be made by you. Repairs are to be made only by Multi-Tech Systems or its licensees. Unauthorized repairs void registration and warranty.
9. This equipment should not be used on party lines or coin lines.
10. Manufacturer and device information:

Manufacturer:	Multi-Tech Systems, Inc.
Trade name:	RouteFinder®
Model Numbers:	RF850VPN, RF860VPN
Service Center in U.S.A.:	Multi-Tech Systems Inc. 2205 Woodale Drive Mounds View, MN 55112 (763) 785-3500 Fax (763) 785-9874

**Industry Canada for the Modem Operation**

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.  
Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

**Canadian Limitations Notice for the Modem Operation**

**Notice:** The ringer equivalence number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a phone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the ringer equivalence numbers of all the devices does not exceed 5.

**Notice:** The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations. Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, phone lines, and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

**Caution:** Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.



# Appendix H – License Agreements

## ***Multi-Tech Systems, Inc. End User License Agreement (EULA)***

### **IMPORTANT - READ BEFORE OPENING THE SOFTWARE PACKAGE**

This is a basic multi-user software license granted by Multi-Tech Systems, Inc., a Minnesota corporation, with its mailing address at 2205 Woodale Drive, Mounds View, MN 55112.

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## **Appendix I – Waste Electrical and Electronic Equipment Directive (WEEE)**

### ***Waste Electrical and Electronic Equipment (WEEE) Directive***

The WEEE directive places an obligation on manufacturers, distributors and retailers to take-back electronic products at the end of their useful life. A sister Directive, ROHS (Restriction of Hazardous Substances), complements the WEEE Directive by banning the presence of specific hazardous substances in the products at the design phase. The WEEE Directive covers all Multi-Tech products being sold into the EU as of August 13, 2005. Manufacturers, distributors and retailers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

### ***Instructions for Disposal of WEEE by Users in the European Union***

The symbol shown below is on the product or on its packaging which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of the user's waste equipment by handing it over to a designated collection point for the recycling of electrical and electronic waste equipment. The separate collection and recycling of waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the seller from whom you purchased the product.



06/27/2005

# Glossary

**\* (Asterisk character)** – The ‘wildcard’ character, used to signify “all within this group or function” (e.g., use \* to specify all domain names). A special symbol that stands for one or more characters. Many operating systems and applications support wildcards for identifying files and directories. This lets you select multiple files with a single specification. For example, in DOS and Windows, the asterisk (\*) is a wild card that stands for any combination of letters.

**:** (**colon character**) – The character used by the RouteFinder **Web Admin** software for a port range. For example, to enter the S-Port/Client source port number as a port range, enter 1024:64000.

**,** (**comma character**) – The character used by the RouteFinder **Web Admin** software for a list of port numbers. For example, to enter the S-Port/Client source port number as a list of port numbers, enter 25, 80, 110.

**-** (**dash character**) – An acceptable RouteFinder WebAdmin entry field character. For example, from **VPN > IPSec > Add an IKE connection > Secret** you can enter a shared **Secret** using alphanumeric characters, the dash (-) or the space or underline (\_) characters.

**\_** (**space or underscore character**) – An acceptable RouteFinder WebAdmin entry field character. For example, from **VPN > IPSec > Secret** you can enter a shared **Secret** using alphanumeric characters, the dash (-) or the space or underline (\_) characters.

**3DES (Triple Data Encryption Standard)** – The 3DES encryption algorithm combines three uses of single DES with two keys, making the key size 112 bits. With the increase in size, 3DES is much more secure than DES, but 3DES runs slower than DES. The RouteFinder supports up to 256 tunnels with 3DES encryption throughput of 15M bps (e.g., 3DES can be configured in WebAdmin from **VPN > IPSEC**). The RouteFinder uses 3DES as an encryption algorithm and not simple DES (Data Encryption Standard) because simple DES is generally known to be insecure and out of date. The RouteFinder default selection is **3 des-md5-96**.

**AES (Advanced Encryption Standard)** – The U.S. government standard for data encryption. Rijndael was chosen as the U.S. government encryption standard to protect sensitive data and to spur the digital economy, replacing DES. The algorithms used by the Rijndael AES have since been adopted by businesses and organizations worldwide.

**Alias** – A name, usually short, easy to remember is translated into another name, usually long and difficult to remember.

**Anonymous FTP** – Anonymous FTP allows a user to retrieve documents, files, programs, and other archived data from anywhere in the Internet without having to establish a user ID and password. By using the special user ID of "anonymous" the network user will bypass local security checks and will have access to publicly accessible files on the remote system.

**ARP (Address Resolution Protocol)** – An IETF standard that allows an IP node to determine the hardware (datalink) address of a neighboring node. ARP provides a method of converting Protocol Addresses (e.g., IP addresses) to Local Network Addresses (e.g., Ethernet addresses). ARP exists as a low-level protocol within the TCP/IP suite and is used to "map" IP addresses to Ethernet (or other) addresses (i.e., ARP provides the physical address when only the logical address is known).

**Attack** – An attempt at breaking part or all of a cryptosystem; can be either a successful or unsuccessful attempt. Many types of attacks can occur (e.g., algebraic attack, birthday attack, brute force attack, chosen ciphertext attack, chosen plain text attack, known plain text attack, linear cryptanalysis, middleperson attack).

**Authentication** – The action of verifying information such as identity, ownership or authorization. Authentication is a security process where user access is allowed only if user authentication verifies the identity of the user requesting access to network resources. Authentication is one of the functions of IPSec. Authentication establishes the integrity of a data stream, ensures that it is not tampered with in transit, and confirms the data stream's origin. Authentication establishes the legitimacy of users and defines the allowed parameters of the session they establish.



**Authentication Header (AH)** – A provision of IPSec that adds a digital signature to an IP packet. The digital signature is created through a key-controlled "hashing" of each packet, providing user authentication, and system integrity.

**Broadcast** – The address that a computer refers to if it wants to address all the computers of a network. Example: for a network with the IP address 212.6.145.0 and a net mask 225.225.225.240, a broadcast would be the address 212.6.145.15.

**CSS (Cascading Style Sheets)** – HTML was intended to mark up only a Web page's structure, but not its on-screen display characteristics. For Web page appearances, the World Wide Web Consortium (W3C) developed a complementary markup system called Cascading Style Sheets (CSS) to make it easier to define a page's appearance without affecting its HTML structure. HTML can be frustrating when trying to control the appearance of a Web page and its contents. Style sheets work like templates: you define the style for a particular HTML element once, and then use it over and over on any number of Web pages. To change how an element looks, you just change the style; the element automatically changes wherever it appears. (Before CSS, you had to change the element individually, each time it appeared.) Style sheets let Web designers more quickly create consistent pages and more consistent web sites.

Browsers began supporting the first CSS Specification, Cascading Style Sheets, Level 1 (CSS1), in versions 3.0 of Opera and Microsoft Internet Explorer and in version 4.0 of Netscape Navigator. The 4.0 and later versions of all three browsers also support properties from the newer Cascading Style Sheets, Level 2 (CSS2) specification, which let you specify elements' visibilities, their precise positions on the page, and how they overlap each other.

**Certificate** – A cryptographically signed object that contains an identity and a public key associated with the identity. Public key certificates are digital stamps of approval for electronic security. The three main characteristics of certificates are 1) provide identification of the web site and the owner, 2) contain the public key to be used to encrypt and decrypt messages between parties, and 3) provide a digital signature from the trusted organization that issued the certificate, as well as when the certificate expires.

**Certificate Authority** – The issuer of a certificate is the Certificate Authority (CA). The CA is the party that digitally signs a certificate and ensures its validity. There are two types of CAs, private and public. Private CAs issue certificates for use in private networks where they can validate the certificate. Public CAs issues certificates for servers that belong to the general public. A Public CA must meet certain requirements before they are added as a root authority to a browser. Since this is a controlled process, all public CA must be registered to issue certificates.

**Certificate Revocation List** – A log of certificates that have been revoked before their expiration date.

**Cipher** – An encryption/decryption algorithm.

**Ciphertext** – Encrypted data.

**Client-Server Model** – A common way to describe the paradigm of many network protocols. Examples include the name-server/name-resolver relationship in DNS and the file-server/file-client relationship in NFS.

**CHAP (Challenge Handshake Authentication Protocol)** – An IETF standard for authentication using PPP which uses a "random Challenge", with a cryptographically hashed "Response" which depends on the Challenge and a secret key.

**Client** – A client is a program that communicates with a server via a network, so as to use the service provided by that server. Example: Netscape is a www client, with the help of which one can call up information from a www server.

**Client-Server Principle** – Applications based on the client-server principle use a client program (client) at the user-end that exchanges information with a server on the network. Usually the server is responsible for the data keeping, while the client takes over the presentation of this information and the interaction with the user. For this, the server and the client employ an exactly defined protocol. All the important applications in the Internet (e.g. www, FTP, news) are based on the client-server principle.

**CMP (Certificate Management Protocol)** – A protocol defining the online interactions between the end entities and the certification authority in PKI. It is written by PKIX working group of IETF and is specified in document RFC 2510.

**Compromise** – The unintended disclosure or discovery of a cryptographic key or secret.

**CRL** – Certificate Revocation List.

**Cryptography** – The art and science of using mathematics to secure information and create a high degree of trust in the networking realm. See also public key, secret key.

**CSR (Certificate Signing Request)** – The form used to obtain a certificate from a CA. A CSR generates a formatted certification. This request is located on the web site of all certificate authorities. Another way to generate a CSR is to use a utility such as Microsoft IIS or OpenSSL.

**Datagram** – The unit of transmission at the ISO Network layer (such as IP). A datagram may be encapsulated in one or more packets passed to the data link layer. A datagram is a self-contained, independent entity of data carrying sufficient information to be routed from the source to the destination computer without reliance on earlier exchanges between this source and destination computer and the transporting network.

**DefaultRoute** – A routing table entry that is used to direct packets addressed to networks not explicitly listed in the routing table.

**DES (Data Encryption Standard)** – A secret key encryption scheme; contrast with “public key”. DES is an NIST standard for a secret key cryptography method that uses a 56-bit key.

**Destination Port Number ZZZZ** – All the traffic going through the firewall is part of a connection. A connection consists of the pair of IP addresses that are talking to each other, as well a pair of port numbers. The destination port number often indicates the type of service being connected to. When a firewall blocks a connection, it will save the destination port number to its logfile.

Port numbers are divided into three ranges:

- The Well-Known Ports are those from 0 through 1023. These are tightly bound to services, and usually traffic on this port clearly indicates the protocol for that service. For example, port 80 virtually always indicates HTTP traffic.
- The Registered Ports are those from 1024 through 49151. These are loosely bound to services, which means that while there are numerous services “bound” to these ports, these ports are likewise used for many other purposes. For example, most systems start handing out dynamic ports starting around 1024.
- The Dynamic and/or Private Ports are those from 49152 through 65535. In theory, no service should be assigned to these ports.

**DHCP (Dynamic Host Configuration Protocol)** – An IETF standard for dynamically allocating and managing a pool of IP addresses, allowing a smaller number of addresses to serve a much larger number of users.

**Digital Signature** – The encryption of a message digest with a private key. Digital signatures are based on public-key cryptography, which was first introduced by Whitfield Diffie and Martin Hellman of Stanford University in 1976. Until 1976 there was only conventional cryptography, which uses the same key to both scramble (encrypt) and unscramble (decrypt) information. Public key cryptography is based on two keys, a private key and a public key.

Where conventional cryptography is a one-key system for both locking (encrypting) and unlocking (decrypting) a message, public key cryptography uses different keys for locking and unlocking.

In public-key systems, one key can be kept private while the other key is made public. Knowing the public key does not reveal the private key.

**DMZ (De-militarized Zone)** – A special LAN on the public network side of a firewall to allow a single WAN router to support both private (VPN) and public access to resources. A DMZ allows a single WAN router to support both private (VPN) and public access to resources. Using a DMZ allows one IP Address (computer) to be exposed to the Internet. Some applications require multiple TCP/IP ports to be open. A DMZ allows just one computer to be exposed for that purpose. It is recommended that you set your computer with a static IP if you want to use DMZ.

**DNAT (Dynamic NAT)** – Used to operate a private network behind a firewall and make network services that only run there available to the Internet.

The use of private IP addresses in combination with Network Address Translation (NAT) in the form of Masquerading, Source NAT (SNAT), and Destination NAT (DNAT) allows a whole network to hide behind one or a few IP addresses preventing the identification of your network topology from the outside. With these mechanisms, Internet connectivity remains available, while it is no longer possible to identify individual machines from the outside. By using Destination NAT (DNAT), it is still possible to place servers within the protected network/DMZ and make them available for a certain service.

In DNAT, only the IP address – not the port – is translated. Typically, the number of externally visible IP addresses is less than the number being hidden behind the NAT router.

**DNS (Domain Name System)** (also **Domain Name Service**) – Refers to the more user-friendly names, or aliases instead of having to use computer-friendly IP addresses. Name servers take care of the conversion from number to name. Every institution connected to the Internet must operate at least two independent name servers that can give information about its names and numbers. Additionally, there is a name server for every top-level domain that lists all the subordinate name servers of that domain. Thus the Domain Name System represents a distributed hierarchical database. Normally, however, the database is not accessed by the user him-/herself, but by the network application that he/she is presently working with.

**DDoS (Distributed Denial of Service)** – Attacks are a nefarious extension of DoS attacks because they are designed as a coordinated attack from many sources simultaneously against one or more targets. See also "DoS attacks".

**DoS (Denial of Service) attacks** – A major concern to the Internet community because they attempt to render target systems inoperable and/or render target networks inaccessible. DoS attacks typically generate a large amount of traffic from a given host or subnet and it's possible for a site to detect such an attack in progress and defend themselves. See also "Distributed DoS attacks".

**Encapsulation** – The technique used by layered protocols in which a layer adds header information to the protocol data unit (PDU) from the layer above. For example, in Internet terminology, a packet would contain a header from the physical layer, followed by a header from the datalink layer (e.g., Ethernet), followed by a header from the network layer (IP), followed by a header from the transport layer (e.g. TCP), followed by the application protocol data.

**Encryption** – A form of security wherein readable data is changed to a form that is unreadable to unauthorized users. Encryption involves the conversion of data into a secret code for transmission over a public network. The original (plain) text is converted into coded form (called cipher text) using an encryption algorithm. The cipher text is decoded (decrypted) at the receiving end, and is converted back into plain text.

**ESP (Encapsulating Security Payload)** – An authentication protocol much like AH. IP ESP may be applied in combination with AH. Security services can be provided between a pair of communicating hosts, between a pair of communicating security gateways, or between a security gateway and a host. ESP may be used to provide the same security services as AH, plus it provides an encryption service. The main difference between the ESP authentication method and the AH authentication method is that ESP does not protect any IP header fields unless those fields are encapsulated by ESP (tunnel mode). ESP is important for the integrity and encryption of datagrams. You can define ESP (and other protocols) for the RouteFinder from **VPN > IPSec**.

**Expiration Date** – Certificates and keys may have a limited lifetime, and expiration dates are used to monitor and control their useful life.

**Filter** – A set of rules that define what packets may pass through a network. Filters can use source, destination, or protocol to determine whether to pass or discard a packet transmission. Part of a packet (the header) must contain information that matches the information in the defined rules or else the packet filter will discard it.

**Filtering** – The act or process of defining which data traffic is to be allowed between the network and hosts, typically using packet filter rules. Filtering is the central part of firewall security. With packet filter rules, you define which data traffic is allowed between the networks and hosts. You can also define particular packets to be filtered and are not to be allowed to pass through the firewall. Several types of filtering exist (e.g., Protocol filtering, port number filtering, URL address filtering, and IP address filtering).

**Finger** – Windows NT and 2000 have a TCP/IP utility called **Finger**. This utility is an old TCP/IP tool (very popular on UNIX systems) that matches an email address with the person who owns it and provides information about that person. While the Finger utility is fairly old (there are more advanced tools available that perform the same general function), it still works and can be a useful tool in certain situations.

The Finger utility was actually developed as the Finger Information Protocol. Finger was designed to provide an interface to the Remote User Information Program (RUIP). RUIP provides information about users who have accounts on UNIX-based computer networks. The Finger utility was created six years before the Internet was born. The first documentation on the Finger utility was in IETF RFC742, dated December 1977. A popular slogan promoting the phone book's yellow pages was "Let your fingers do the walking". The utility was christened "Finger", since the utility was basically designed for tracking down people.

The Finger Information Protocol let UNIX users on college campuses create a profile, called a "Plan page", which included personal and job-related information. A Plan page was similar to a personal home page on the Internet today. So when someone "Fingered" your email address, they learned more about you. The Finger utility is a command line tool, so in Windows NT or Windows 2000 you must first access a command-prompt window to use it. You then type the command followed by an email address.

**Firewall** – A device that serves to shield and thus protect a (partial) network (e.g., RouteFinder) from another network (e.g. the Internet). The entire network traffic runs via the firewall where it can be controlled and regulated. Technically, this can be achieved in different ways. The use of special hardware firewalls is rare. More frequent is the use of routers with firewall options using firewall software on a dedicated computer.

**Gateway** – A combination of hardware and software that links two different types of networks. E.g., gateways between email systems allow users on different email systems to exchange messages.

**Hacker** – A person who tries to, and/or succeeds at defeating computer security measures.

**Hacking Lexicon** – The terms used by hackers; entire dictionaries exist to document hacking terms (e.g., <http://www.robertgraham.com/pubs/hacking-dict.html>). These documents clarify many of the terms used within the context of information security (infosec).

**Hash** – A one-way security function that takes an input message of arbitrary length and produces a fixed-length digest. Used in SHA (Secure Hash Algorithm).

**Header** – The portion of a packet, preceding the actual data, containing source and destination information. It may also error checking and other fields. A header is also the part of an electronic mail message that precedes the body of a message and contains, among other things, the message originator, date and time

**Host** – In client-server architectures, the computer on which the server software is running is called the host. It is possible for several servers to be running on one host, e.g. one FTP server and one email server. Hosts can be accessed with the help of clients; e.g., with a browser or an email program. A host is also called a node in the Internet. Using an Internet host (as opposed to a local host), it is possible to work from a distance (remote access).

**Host** – A computer that allows users to communicate with other host computers on a network. Individual users communicate by using application programs, such as electronic mail, Telnet, and FTP.

**HTTPS (aka, S-HTTP)** – Secure HyperText Transfer Protocol, a secure way of transferring information over the World Wide Web. HTTPS refers to the entry (e.g., <https://192.168.2.100>) used for an S-HTTPS connection. S-HTTPS is the IETF RFC that describes syntax for securing messages sent using the Hypertext Transfer Protocol (HTTP), which forms the basis for the World Wide Web. S-HTTP provides independently applicable security services for transaction confidentiality, authenticity/integrity and non-reputability of origin. S-HTTP emphasizes maximum flexibility in choice of key management mechanisms, security policies and cryptographic algorithms by supporting option negotiation between parties for each transaction.

**ICMP** – The **Internet Control Message Protocol** notifies the IP datagrams sender about abnormal events. ICMP might indicate, for example, that an IP datagram cannot reach an intended destination, cannot connect to the requested service, or that the network has dropped a datagram due to old age. ICMP also returns information to the transmitter, such as end-to-end delay for datagram transmission.

**IETF (Internet Engineering Task Force)** – The international standards body that has standardized the IP protocol and most of the other successful protocols used on the Internet. The IETF web page is at <http://www.ietf.org/>.

**IKE (Internet Key Exchange)** – A hybrid Internet protocol used to establish a shared security policy and authenticated “keys” for services, such as IPSec, that require keys.

**IP** – The **Internet Protocol** (IP) is the basic protocol for the transmission of Internet information. It has been in use virtually unchanged since 1974. It establishes and ends connections, as well as recognizing errors. By using NAT and Masquerading, private networks can be mapped onto official IP addresses. This way, the Ipv4 address space will still last a long time. Standard Internet open protocols include:

<u>Protocol</u>	<u>Function</u>
TCP/IP	basic network communication
HTTP	browsing
NFS	File Service
IMAP4/SMTP	Mail Service
DNS	Naming Service
DNS/LDAP	Directory Services
Bootp/DHCP	Booting Services
SNMP	Network Administration



**IP Address** – A 32-bit number that identifies the devices using the IP protocol. An IP address can be unicast, broadcast, or multicast. See RFC 791 for more information. Every host has a clear IP address, comparable with a telephone number. An IP address consists of four decimal numbers between 1 and 254, divided by dots (e.g., a possible IP address is 212.6.145.0. At least one name of the form xxx belongs to every IP address (e.g. xxx). This defines a computer with the name ox that is in the sub domain xxx of the sub domain xxx of the domain xxx. Like with IP addresses, the individual name parts are divided by dots. However, as opposed to IP addresses, IP names are not limited to four parts. Also, several IP names can be assigned to one IP address; these are referred to as aliases.

**IP Header** – The part of the IP packet that carries data used on packet routing. The size of this header is 20 bytes, but usually the IP options following this header are also calculated as header. The maximum length of the header is 60 bytes. The header format is defined in RFC 791.

**IP Packet** – A self-contained independent entity of data carrying sufficient information to be routed from the source to the destination computer without relying on any earlier exchange between this source and destination computer and the transporting network. The Internet Protocol (IP) is defined in RFC 791.

**IP Payload** – The part of the IP packet that carries upper level application data.

**IPSec (IP Security)** – A set of IETF standards that provide authentication and encryption for IP-based and Internet-based VPNs.

**Key** – A data string which, when combined with source data (packet) using a special algorithm, produces output that cannot be read without that specific key. Key data strings are typically 40-168 bits in length.

**Key Agreement** – A process used by two or more parties to agree upon a secret symmetric key.

**Key Exchange** – A process used by two more parties to exchange keys in cryptosystems.

**Key Generation** – The act or process of creating a key.

**Key Management** – The various processes that deal with the creation, distribution, authentication, and storage of keys.

**Key Pair** – Full key information in a public-key cryptosystem; consists of the public key and private key.

**L2TP (Layer Two Tunneling Protocol)** – A security protocol that facilitates the tunneling of PPP packets across an intervening network in a way that is highly-transparent to both end-users and applications. L2TP is defined in IETF RFC 2661.

**LILO (Linux Loader)** – LILO is a small program that sits on the master boot record of a hard drive or on the boot sector of a partition. LILO is used to start the loading process of the Linux kernel. (There are other programs that can also do this, such as **grub**. Most distributions/versions of Linux use LILO.) You can set up lilo to require a password to start to load the Linux kernel, or you can set it up to require a password if you want to pass any extra options to the Linux kernel before it starts loading.

**Mapping** – Logically associating one set of values (such as addresses on one network) with values or quantities on another set (such as devices on another network). Examples include name-address mapping, inter-network route mapping, and DNAT port mapping. Name resolution (name to address mapping) is another example.

**Masquerading** – The concealing of internal network information (LAN) from the outside. For example, the computer of a colleague with the IP address is inside a masked network. All the computers inside his network are assigned one single, official IP address (i.e. if he starts an HTTP request into the Internet, his IP address is replaced by the IP address of the external network card). This way, the data packet entering the external network (Internet) contains no internal information. The answer to the request is recognized by the firewall and diverted to the requesting computer.

**MD5 (Message Digest 5)** – A one-way hashing algorithm that produces a 128-bit hash. It computes a secure, irreversible, cryptographically strong hash value for a document. The MD5 algorithm is documented in IETF RFC 1321.

**Message Digests** – Mathematical functions (aka, one-way hashes) that are easy to compute but nearly impossible to reverse. The message digest serves as a "fingerprint" for data. As such, it is an element of most data security mechanisms (e.g., Digital Signatures, SSL, etc.). The hashing function takes variable-length data as input, performs a function on it, and generates a fixed-length hash value.

**MPPE (Microsoft Point-to-Point Encryption)** – An encryption technology developed by Microsoft to encrypt point-to-point links. The PPP connections can be over a VPN tunnel or over a dial-up line. MPPE is a feature of Microsoft's MPPC scheme for compressing PPP packets. The MPPC algorithm was designed to optimize bandwidth utilization in supporting multiple simultaneous connections. MPPE uses the RC4 algorithm, with either 40-bit or 128-bit keys, and all MPPE keys are derived from clear text authentication of the user password. The RouteFinder supports MPPE 40-bit/128-bit encryption.

**Name Resolution** – The process of mapping a name into its corresponding address.

**NAT (Network Address Translation)** – IP NAT is comprised of a series of IETF standards covering various implementations of the IP Network Address Translator. NAT translates multiple IP addresses on the private LAN to one public address that is sent out to the Internet. This adds a level of security since the address of a PC connected to the private LAN is never transmitted on the Internet.

**Netfilter** – The Linux packet filter and network address translation (NAT) system that aims to reduce the number of filter points and to separate the filtering function from the NAT function. Netfilter is derived from the Linux **ipchains** and the Unix **ipfilter** packet filtering systems. The RouteFinder uses a Linux 2.4 kernel (and, for example, **iptables** for the internal logic in the netfilter code).

**Network Card** – The Ethernet PC card used to connect the RouteFinder to the internal, external or DMZ network (aka: NIC or NIC card).

**NIC (Network Interface Card)** – The Ethernet PC card used to connect the RouteFinder to the internal, external or DMZ network (aka, Network Card).

**Nslookup** – A Unix program for accessing name servers. The main use is the display of IP names for a given IP address and vice versa. Beyond that, other information can also be displayed (e.g., aliases).

**Packet Filter** – An operation that blocks traffic based on a defined set of filter "rules" (e.g., IP address or port number filtering).

**PCT (Private Communications Technology)** – A protocol developed by Microsoft that is considered more secure than SSL2. (Note that some web sites may not support the PCT protocol.)

**PING (Packet InterNet Groper)** – A program to test reachability of destinations by sending an ICMP echo request and waiting for a reply. The term is also used as a verb: "Ping host X to see if it is up."

**PKI (Public Key Infrastructure)** – Consists of end entities that possess key pairs, certification authorities, certificate repositories (directories), and all of the other components, software, and entities required when using public key cryptography.

**Plaintext** – Information (text) which has not been encrypted. (The opposite is ciphertext.)

**PFS (Perfect Forward Secrecy)** – Refers to the notion that any single key being compromised will permit access to only data protected by that single key. In order for PFS to exist, the key used to protect transmission of data must not be used to derive any additional keys. If the key used to protect transmission of data was derived from some other keying material, that material must not be used to derive any more keys. Sometimes referred to as Perfect Secret Forwarding, **PSF** is a security method that ensures that the new key of a key exchange is in no way based on the information of an old key and is therefore unambiguous. If an old key is found or calculated, no conclusions can be drawn about the new key. On the RouteFinder, PFS is configured in **VPN > IPSec**.

**Policy** – The purpose of an IPSec Security Policy is to define how an organization is going to protect itself. The policy will generally require two parts: a general policy and specific rules (e.g., a system-specific policy). The general policy sets the overall approach to Security. The rules define what is and what is not allowed. The Security Policy describes how data is protected, which traffic is allowed or denied, and who can and cannot use various network resources.

**Port** – Where as only the source and target addresses are required for transmission on the IP level, TCP and UDP require further characteristics to be introduced that allow a differentiation of the separate connections between two computers. A connection on the TCP and UDP level are thus clearly identified by the source address and the source port, as well as by the target address and the target port.

**Port Range** – A series of TCP or UDP port numbers that can be set in RouteFinder protocol service definitions. For example, when adding a service from **Networks & Services > Services**, enter the source (client) port. The entry options are a single port (e.g. 80), a list separated by commas (e.g. 25, 80, 110), or a port range (e.g. 1024:64000).

**Port Scanning** – Attempting to find "listening" UDP or TCP ports on an IP device, and then obtaining information about the device. Port scanning itself is not harmful, but it can be used by hackers to allow intrusion by brute-force password guessing.

**PPP (Point-to-Point Protocol)** – An IETF standard which provides a method for transporting multi-protocol datagrams over point-to-point links. All of the users on the Ethernet connection share a common connection, so the Ethernet principles supporting multiple users in a LAN are combined with the principles of PPP, which typically apply to serial connections.

**PPPoE (Point-to-Point Protocol over Ethernet)** – An IETF standard which provides the ability to connect a network of hosts over a simple bridging access device to a remote access concentrator. To provide a point-to-point connection over Ethernet, each PPP session must learn the Ethernet address of the remote peer, as well as establish a unique session identifier.

**PPTP (Point-To-Point Tunneling Protocol)** – A protocol that allows secure remote access to corporate networks (VPNs) over the Internet. All data sent over a PPTP connection can be encrypted and compressed, and multiple network level protocols (TCP/IP, IPX) can be run concurrently.

**Protocol** – A clearly defined and standardized sentence of commands and answers, with whose help a client and a server can communicate. Well-known protocols and the services they provide are, for example, HTTP (www), FTP (ftp), and NNTP (news).

**Proxy (Application Gateway)** – The task of a proxy (Application Gateway) is to completely separate the communication connections between the external network (Internet) and the internal network (LAN). There must be no direct connection between an internal system and an external computer. The proxies work exclusively on the application level. Firewalls that are based on proxies use a dual homed gateway that does not transfer any IP packets. The proxies that run as specialized programs on the gateway can now receive connections for a special protocol, process the received information at the application level, and then transfer them.

**Proxy ARP** – The technique in which one machine, usually a router, answers ARP requests intended for another machine. By "faking" its identity, the router accepts responsibility for routing packets to the "real" destination. Proxy ARP allows a site to use a single IP address with two physical networks. Subnetting would normally be a better solution.

**Private Key** – In public key cryptography the private key is only known to the holder, and it can be used to sign and decrypt messages.

**Proxy** – A cache server that acts as a firewall, protecting the local network. It allows an application inside the proxy to access resources on the global Internet.

**PSK (Pre Shared Key)** – A PSK password must be entered at both ends of the VPN tunnel. This password is also called the secret. The holder of this password can establish a VPN connection to the secure network. Make sure that this password does not reach the wrong hands and that you change the PSK password at regular intervals.

**Public Key** – In public key cryptography the public key, which is included in the certificate, can be used to verify signatures and encrypt messages. A sample public key is shown below:

```
0sAQNic1Twww7iknvNd6ieKDhd9JTU/Krbc71H4oIFd/xqKJntU8x25M
0WbXr0gQngECdZPWHj6KeSVtMtslzXMkxDecdawoCadPtPiH/In23
GKUOt3GoDVMob+fob9wBYbwdHOxPAYtNQBXNPEU9PGMxQdYp
8io72cy0duJNCXkEVvpvYvVzkmp0xVYOWYkfjiPsdhzn5FCitEh6XsC
e0ctByoLjKA1C+mLiAWhuycVojr2JwzSqUIJXzS6nV4yrpl+QY5o5yzt
gjVlgwW1Er6jyjo2aeFLgucqjuHSZ+sX0dz/OfdQ0N0AJRAmO3eknO
YLk2DPRkmUeYr3W95q1Z2j/+4GRlzzP8ZoyPwDbv7hpZ0TRA9c38a
26+La8N2/TDKx+fGLfixB6Ed8X0jCmq4lt7iD2d/9EWeaUZfctqaKfw==
```

Public key cryptography is based on two keys, a private key and a public key. Where conventional cryptography is a one key system for both locking (encrypting) and unlocking (decrypting) a message, whereas public key cryptography uses different keys for locking and unlocking. In public-key systems, one key can be kept private while the other key is made public. Knowing that the public key does not reveal the private key.

**PuTTY** – A simple but excellent **SSH** and **Telnet** replacement for Windows 95/98/NT that happens to be free. Installation is simple - you download **PuTTY.exe** and store it somewhere on your system that's convenient.

**QMAIL** – A security-oriented Unix mailer daemon developed by Dan Bernstein.

**RADIUS** – RADIUS stands for **Remote Authentication Dial-In User Service**. RADIUS is a protocol with which the router can obtain information for the user authentication from a central server.

**RFC (Request For Comments)** – A document of Internet Society under standardization. See also IETF.

**RFC 921** – A policy statement on the implementation of the Domain Style Naming System on the Internet. RFC 921 details the schedule for the implementation for the Domain Style Naming System in terms of 1) the names themselves, 2) the method of translating names to addresses, and 3) the relationship between the Internet and the rest of the world.

**RFC 953** – The official IETF specification of the Hostname Server Protocol, a TCP-based host information program and protocol. The function of this server is to deliver machine-readable name/address information describing networks, gateways, hosts, and eventually domains, within the Internet environment. To access this server from a program, establish a TCP connection to port 101 (decimal) at the service host, SRI-NIC.ARPA (26.0.0.73 or 10.0.0.51).

**RFC 1918** – An IETF standard for Address Allocation for Private Internets.

**Rijndael** (pronounced *Rhine-doll*) – A security standard for data encryption chosen as the proposed U.S. government AES standard to protect sensitive data and to spur the digital economy, replacing DES. The RouteFinder uses Rijndael in the SSH IPsec client software (refer to Appendix F of this manual).

**Router (Gateway)** – A router is a device that selects intelligent pathways for network packets. Strictly speaking, a gateway is something different than a router, but in connection with TCP/IP, both terms are synonyms. To establish connections throughout world and not just stay within one's own network, one has to introduce this router (gateway) to one's computer. Normally, the highest address on the network 134.93.178.0 is the address 134.93.179.254 (since 134.93.179.255 is the broadcast). Generally, a router is a node that forwards packets not addressed to itself. Requirements for a router are defined in IETF RFC 1812.

**RSA** – A public key encryption and digital signature algorithm. It was invented by Ron Rivest, Adi Shamir, and Leonard Adleman. The RSA algorithm was patented by RSA Security, but the patent expired in September 2000.

**Rsync** – A synchronization protocol that uses checksums to determine differences (as opposed to using modification dates) and does a partial file transfer (transferring only the differences instead of entire files).

**Rsync** was developed by Andrew Tridgell and Paul Mackerras; the **rsync** daemon (**rsyncd**) provides an efficient, secure method for making files available to remote sites.

**Rules** – Configuration settings used to set how packets are filtered. Rules are set with the network and service definitions set up in the **Networks & Services** menu. When setting packet filter rules, the two basic types of security policies are:

1. All packets are allowed through – the rules setup must be informed explicitly what is forbidden.
2. All packets are blocked – the rules setup needs information about which packets to let through.  
This lets you explicitly define which packets may pass through the filter. All other packets are blocked and can be displayed for viewing. See also "Filtering".

**SA (Security Association)** – A unidirectional connection created for security purposes. All traffic traversing an SA is provided the same security processing. In IPsec, an SA is an Internet layer abstraction implemented via the use of an AH or ESP. It contains data controlling how a transformation is applied to an IP packet. The data is determined using specially defined SA management mechanisms. The data may be the result of an automated SA and key negotiation or it may be defined manually. The SA is defined in IETF RFC 2401.

**SCP (Secure copy)** – The main purpose of SCP is the safe copying of files between local and remote computers. The RouteFinder supports login using SCP. A Windows SCP client can be downloaded from <http://winscp.vse.cz/eng/>. WinSCP is freeware SCP client for Windows 95/98/2000/NT using SSH (Secure shell). WinSCP manages some other actions with files beyond the basic file copying function.

**Secret Key** – The key used both for encryption and decryption in secret-key cryptography.

**Secure Channel** – A communication medium that is safe from the threat of eavesdroppers.

**Seed** – A random bit sequence used to generate another, usually longer, pseudo-random bit sequence.



**Security Policy** – Enterprises should have a carefully planned set of statements in place regarding network protection. A good corporate Internet security policy should define acceptable use, acceptable means of remote access, information types and required encryption levels, firewall hardware and software management processes and procedures, non-standard access guidelines, and a policy for adding new equipment to the network. New security protocols, new services, and security software upgrades should also be considered. The purpose of a security policy is to define how an organization is going to protect itself. The policy will generally require two parts: a general policy and specific rules (system specific policy). The general policy sets the overall approach to security. The rules define what is and what is not allowed. The security policy describes how data is protected, which traffic is allowed or denied, and who is able to use the network resources.

**Server** – A server is a device on the network that provides mostly standardized services (e.g., www, FTP, news, etc.). To use these services, you as a user require the comparable client requirements for the desired service.

**SHA (Secure Hash Algorithm)** – A United States government standard for a strong one-way, hash algorithm that produces a 160-bit digest. See MD5. SHA-1 is defined in FIPS PUB 180-1.

**SHA-1 (Secure Hash Algorithm version one)** – The algorithm designed by NSA, and is part of the U.S. Digital Signature Standard (DSS).

**S-HTTP (Secure HTTP)** – The IETF RFC that describes a syntax for securing messages sent using the Hypertext Transfer Protocol (HTTP), which forms the basis for the World Wide Web. Secure HTTP (S-HTTP) provides independently applicable security services for transaction confidentiality, authenticity/integrity and non-reputability of origin. The protocol emphasizes maximum flexibility in choice of key management mechanisms, security policies, and cryptographic algorithms by supporting option negotiation between parties for each transaction. The current IETF RFC describes S-HTTP version 1.2. Previous versions of S-HTTP numbered 1.0 and 1.1 have also been released as Internet-Drafts.

**SNAT (Source NAT)** – A functionality equivalent to DNAT, except that the source addresses of the IP packets are converted instead of the target address. This can be helpful in more complex situations (e.g., for diverting reply packets of connections to other networks or hosts). In contrast to Masquerading, SNAT is a static address conversion, and the rewritten source address does not need to be one of the firewall's IP addresses. To create simple connections from private networks to the Internet, you should use the Masquerading function instead of SNAT. The use of private IP addresses in combination with Network Address Translation (NAT) in the form of Masquerading, Source NAT (SNAT), and Destination NAT (DNAT) allows a whole network to hide behind one or a few IP addresses preventing the identification of your network topology from the outside. With these mechanisms, Internet connectivity remains available, while it is no longer possible to identify individual machines from the outside. Using DNAT makes it possible to place servers within the protected network/DMZ and still make them available for a certain service.

**SOCKS** – A proxy protocol that allows the user to establish a point-to-point connection between the own network and an external computer via the Internet. Socks, also called Firewall Transversal Protocol, currently exists at version 5.

**SPI (Security Parameters Index)** – The SPI is an arbitrary 32-bit value that, in combination with the destination IP address and security protocol (AH), uniquely identifies the Security Association for a datagram. SPI values from 1 through 255 are reserved by the Internet Assigned Numbers Authority (IANA) for future use; a reserved SPI value will not normally be assigned by IANA unless the use of the assigned SPI value is specified in an RFC. It is ordinarily selected by the destination system upon establishment of an SA. You can define SPI (and other protocols) for the RouteFinder from **VPN > IPSEC**. SPI is defined in RFC 2401.

SSH (Secure Shell) is a text-oriented interface to a firewall, suitable only for experienced administrators. The SSH is a secure remote login program available for both Unix and Windows NT. For access via SSH you need an SSH Client, included in most Linux distributions. The Microsoft Windows program PuTTY is recommended as an SSH client. Access via SSH is encrypted and therefore impossible for strangers to tap into.

**Stateful Inspection** – A method of security that requires a firewall to control and track the flow of communication it receives and sends, and to make TCP/IP-based services decisions (e.g., if it should accept, reject, authenticate, encrypt and/or log communication attempts). To provide the highest security level possible, these decisions must be based on the Application State and/or the Communication State (as opposed to making decisions based on isolated packets). With stateful inspection, a firewall is able to obtain, store, retrieve, and manipulate information it receives from all communication layers as well as from other applications. Stateful inspection tracks a transaction and verifies that the destination of an inbound packet matches the source of a previous outbound request. Other firewall technologies (e.g., packet filters or application layer gateways) alone may not provide the same level of security as with stateful inspection.

**Static Route** – A directive in a node that tells it to use a certain router or gateway to reach a given IP subnet. The simplest and most common example is the default router/gateway entry entered onto any IP-connected node (i.e., a static route telling the node to go to the Internet router for all subnets outside of the local subnet).

**Subnet Mask** – The subnet mask or the net mask indicates into which groups the addresses are divided. Based on this arrangement, individual computers are assigned to a network.

**S/WAN** – Secure Wide Area Network is a Linux implementation of IPSEC and IKE for Linux. At the RouteFinder's **VPN > IPSec > Add an IKE connection > RSASig > Generate** function, the imported key must meet S/WAN requirements.

**Syslog** – A service run mostly on Unix and Linux systems (but is also available for most other OSes) to track events that occur on the system. Other devices on the network may also be configured to use a given node's syslog server to keep a central log of what each device is doing. Analysis can often be performed on these logs using available software to create reports detailing various aspects of the system and/or the network.

**TCP (Transmission Control Protocol)** – A widely used connection-oriented, reliable (but insecure) communications protocol; the standard transport protocol used on the Internet. TCP is defined in IETF RFC 793.

**Telnet** – The Internet standard protocol for remote terminal connection service. It is defined in IETF RFC 854 and extended with options by many other RFCs.

**TLS (Transport Layer Security)** – An open security standard that is similar to SSL3. (Note that some web sites may not support the TLS protocol.)

**Trace Route** – A program available on many systems that traces the path a packet takes to a destination. It is mostly used to debug routing problems between hosts. A Trace Route protocol is defined in IETF RFC 1393.

**Trusted Subnetwork** – A subnetwork of hosts and routers that can trust each other not to engage in active or passive attacks. It is also assumed that the underlying communications channel such as a LAN is not being attacked by any other means.

**Tunneling** – Transmitting data that is structured in one protocol within the protocol or format of a different protocol.

**UDP (User Datagram Protocol)** – A datagram-oriented unreliable communications protocol widely used on the Internet. It is a layer over the IP protocol. UDP is defined in IETF RFC 768.

**UNC (Universal Naming Convention) path** – A UNC path is used to help establish a link to a network drive.

**URL (Universal Resource Locator)** – URLs are used to describe the location of web pages, and are also used in many other contexts. URLs are defined in IETF RFCs 1738 and 1808.

**Verification** – The act of recognizing that a person or entity is who or what it claims to be.

**VLAN (Virtual Local Area Network)** – A function allowing some Ethernet switches to be divided into smaller logical groups known as VLANs. On most switches each VLAN operates completely independent of the others, as if each was a separate physical device. Some higher-end switches can also route between VLANs as if each was a separate hub/switch connected by a router.

**VPN (Virtual Private Network)** – A device or program that protects users and their data when exchanging information over the Internet. A VPN can use encryption, user authentication, and/or firewall protection to solve remote access security threats.

**WAN (Wide Area Network)** – A data network, typically extending a LAN beyond a building or campus, linking to other (remote) LANs.

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